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THE NORTH AMERICAN GALL MIDGES OF THE TRIBE MICROMYINI; ITONIDIDAE (CECIDOMYIIDAE); DIPTERA[1, 2]

BY A. EARL PRITCHARD
UNIVERSITY OF CALIFORNIA, BERKELEY, CALIFORNIA

The classification of the North American species of the tribe MICROMYINI (CAMPYLOMYZINI) has been badly in need of revision. Seventy-two North American species have been described which belong in the MICROMYINI; one of these species was described by Say, and all of the others were described by Felt. Fifty-seven of Felt's species were based upon a single specimen each; only five species were described from more than two specimens each. Very few of these species have been recorded since originally described. The generic assignments of the North American species were admittedly provisional, and no general attempt was made to associate sexes. The present treatise of the taxonomy of the nearctic MICROMYINI is based upon a study of all of Felt's types and upon a large amount of additional material most of which was collected by the writer in Minnesota. This comparatively large amount of material enables

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one to reconsider many characters which were formerly regarded specific. Consequently, many species formerly recognized on a basis of slight differences, are not considered valid. Likewise a number of generic transfers are made of earlier described species, because of the more definite generic diagnoses.

Campylomyza Meigen was the only genus generally recognized prior to 1894, for the species now included in the MICROMYINI. The only general treatise of the species of *Campylomyza* up to this time was that by Winnertz (1870). Rondani, during the middle of the nineteenth century, failed to recognize *Campylomyza* and proposed two other genera.

Kieffer (1894), in Germany, began studies which were based upon examination of slide material with a compound microscope. He placed considerable emphasis on minute morphological characters which had not previously been studied, and because of this was inclined to pay little attention to the work of earlier students. Kieffer proposed a number of new genera which are closely related to *Campylomyza*, and he gave tribal rank to this generic group. Felt (1907) began studies of the North American gall midges and soon proposed a few new Micromyine genera. Felt referred many North American species to certain genera which Kieffer had established for European species. In some cases the species were correctly placed, but in many other cases they were incorrectly assigned. Kieffer did not refer any European species to Felt's genera. Many of their genera were established on monosexual characteristics, particularly those of the female, so that generic assignments of the species were unreliable.

Edwards (1938) presented an excellent treatment of the MICROMYINI. His classification was partly based on a number of morphological features which were previously unnoted. Edwards studied a large number of the existing European types, redefined many of the genera on a basis of both sexes, and definitely established for the first time the identity of a large number of species occurring in England. He was also the first to consider certain Micromyine species as occurring in both Europe and North America. Apparently this possibility had been rejected by Felt after a study of the Kieffer collection and other European material.

The writer finds that all of the Micromyine genera now recognized in Europe are also tenable for North American species. A number of species are definitely recognized as occurring in both North America and Europe, and because of the close relationships

of many other species, it is expected that future studies will reveal still others. The Micromyine faunae of continental areas other than Europe and North America are practically unknown.

Acknowledgments

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Biology

There have been very few studies made of the biology of the Micromyini. Although certain habitats of the larvae have been recorded for a number of species, there is very little knowledge of the actual food habits of the larvae. The biology of the North American species is very little known in comparison with that of European species.

The larvae of the Micromyine gall midges are found characteristically in fungi and decaying organic material. Certain species of *Mycophila* and *Monardia* have been reared from mushroom mycelia. A number of species of *Monardia, Peromyia, Aprionus,* and *Campylomyza* have been reared from decaying logs and stumps of both deciduous trees and conifers. Two species of *Aprionus* have been reared from the galleries of scolytids under the bark of pine. One species of *Peromyia* has been reared from decaying peony roots. Species of *Cordylomyia, Polyardis,* and *Mycophila* have been reared

from manure. Larvae of certain species of *Bryomyia, Peromyia,* and *Campylomyza* have been found under moss. The habitats in which one may find a given species may be varied. *Mycophila barnesi,* for instance, has been reared both from mushrooms and manure.

The larvae of a few species have been found more or less associated with higher living plants. *Campylomyza ormerodi* is said to be a pest on red clover roots in England. Another species of *Campylomyza* was reared from strawberry roots in California. The larva of an Indian species of *Peromyia* was found to be associated with leaf galls, but the relationship was regarded as that of inquiline.

Barnes (1929) demonstrated that paedogenesis occurs in *Mycophila speyeri.* Female specimens of other species of *Mycophila* and also *Monardia stirpium* have been observed to contain only a few large eggs; this characteristic in adult midges is correlated with paedogenetic reproduction. Paedogenesis is a biological characteristic of the closely related itonidids in the subfamily HETEROPEZINAE.

Adults of the MICROMYINI are found throughout the spring, summer and fall in the northern United States and Canada. Typically these midges inhabit well-shaded woodlands. Adults of *Campylomyza* are commonly found along ditch banks, roadsides, and in yards and parks where they seem to be more abundant in the spring and in the fall. The males of *Campylomyza* sometimes fly in swarms. Specimens of many species are commonly found on the windows of dwellings, offices, and automobiles. On one occasion the writer found the females of *Corinthomyia brevicornis* to be crepuscular in flight.

MORPHOLOGY

Sensorial Processes.—The flagellum of the female is provided with well-developed sensoria. A generalized condition is found in those species in which each flagellar segment is densely clothed distally with sensorial bristles—bristles which are very thin-walled and very blunt distally. Certain of these bristles may be modified to form sensorial processes which may be elongate and slender, widened proximally and with a distal projection, or disc-shaped; sometimes the processes are partially or mostly subdivided, digitate. The sensorial processes may be short and broad, each arising from several small pores, and apparently formed by the fusion of several processes. The pores may be coalescent to form an irregular, large pore. A single process may be present in the form of a collar around the segment which arises from a number of pores. In one species an

incomplete and irregular ring is formed which is adnate to the segment only at the pores, a condition very similar to that found in the tortuous circumfila of the ITONIDINAE. The first flagellar segment of the female sometimes has one or two pockets containing sensorial bristles. Sensorial processes on the male flagellum are very poorly developed. Sensorial bristles are also found on the inner-dorsal portion of the first palpal segment of both sexes; in the female these bristles are sometimes set in a pocket.

Wings.—The Comstock-Needham system of wing venation is employed with certain modifications. As a matter of convenience, the writer follows Edwards in that the first section of R_s which appears as a cross-vein is termed R_s, and the long distal portion of this vein is termed R_5. Tillyard's modification of the cubitus is adopted, so that the first anal vein of Comstock is termed the posterior cubitus (CuP). Snodgrass has shown the independence of the second anal vein of Comstock from the remaining anal veins, and the writer follows Bradley in referring to this as the plical vein (Pl).

Edwards has employed the position of sensory pores on the veins in the vicinity of R_s as an aid in the recognition of generic groups. There are from two or four such pores on R_1, a similar pore on R_s, and another pore on either r–m or on R_5 between R_s and the level of the end of R_1.

Hypopygium.—Only the tergal portion of the ninth segment is present, and this forms an integral part of the male genitalia. This tergal portion is largely membranous, but a caudal area is usually sclerotized; this tergal plate is here termed the *ninth tergum.* The ninth tergum is connected laterally to the outer-proximal end of each basiclasper. The tergal portion of the tenth segment is usually represented by a pair of small pubescent lobes which are termed the *tenth tergites;* the sternal portion is represented by a setulose area which is usually divided and located underneath the ninth tergum. Felt sometimes used the terms "dorsal plate" and "ventral plate" in this tribe for parts of the ninth or tenth segments.

The periphallic organs consist of a pair of claspers or forceps which are large, each composed of two segments, the *basiclasper* and the *disticlasper.* The basiclaspers below are nearly always united proximally (no subgenital plate is present). The inner-distal margin of each basiclasper bears a long *basiclasper root;* these roots are anteriorly united or connected by a transverse bridge. Each basiclasper root bears a curved *ventral arm* which is connected with the tegmen and which is usually well developed. Edwards has referred to the two segments of the clasper as the "coxite" and "style"

respectively. The term coxite implies a serial homology with other paired segmental appendages, and the writer does not wish to commit himself on such homologies. The term style is particularly objectionable, because Felt and Kieffer previously used this term for the aedeagus or associated structures. Felt has referred to the two segments of the clasper as the "basal clasp segment" and "terminal clasp segment."

Phallic Organs.—There are usually two sclerotized structures associated with the genital or ejaculatory duct. This duct is covered dorsally by a rather broad, saddle-like sclerite which Edwards has termed the *tegmen.* The tegmen is variously modified but each proximo-lateral angle bears a strong tegminal root. There is often a rod-like structure under the tegmen which serves as an intromittent organ. Edwards has termed this the *genital rod.* The proximal end of the genital rod is more heavily sclerotized and bears muscles on either side; these muscles are attached to the proximal roots of the tegmen. The proximal end of the genital rod probably represents an apodeme of the aedeagus. The long distal portion of the genital rod usually appears to be narrowly divided. The common genital duct extends above the base of the genital rod and usually ends in a membranous and setulose sac which lies at the end of the genital rod when this structure is present. The two testes are usually separate, but they may be united in a common sheath. Felt has used the term "style" for the Micromyine genital rod, and he has apparently used the term "harpes" for the tegmen.

Ovipositor.—The ninth abdominal segment contains the opening of the oviduct. The sternal portion of the ninth segment is divided medio-distally; the tergal portion of this segment sometimes has the distal portion separated to appear as an extra segment at the proximal end of the lamellae. A pair of segmented *lamellae* are articulated to the tergal portion of the ninth segment. The proximal segment of each lamella is formed by the lateral half of the medially divided tenth tergum and tenth sternum; the middle segment is formed from the lateral half of the medially divided eleventh tergum; and the distal segment is a cercus. One or two sclerotized *spermathecae* (the "ventral organs" of Felt) are present in the abdominal cavity.

Felt's Types

Nearly all of the types of Felt's species are in the New York State Museum or in the U. S. National Museum. Felt usually did not state the number of specimens examined either with regard to

types or to additional records. Because the Felt collection at Albany, New York, is of such fundamental importance to workers in the group, it has been the aim of the writer to show definitely what material is represented there. The exact disposition of all the types is herein indicated, and all other specimens further recorded from the Felt collection, either by Felt or in the present revision, are indicated as being in that collection by statements as to whether Felt has determined the species or not and, if so, his determinations. Data concerning types published by Felt but which are not on the labels, are indicated as such by the use of brackets. All of Felt's material is mounted on slides, except in certain cases where the material is indicated as being on cardpoints or in alcohol.

Reference Index of Species Described by Felt

Felt's revision of the group in 1913 is the latest comprehensive treatise of the Micromyini for North America, although additional species have been described by him since that time. The type slides of Felt's earlier species were relabelled by him to conform with the generic changes made in his 1913 publication. In view of the fact that the taxonomic views adopted in the present revision differ considerably from those of Felt, a reference index is here included. The names of Felt's species are listed alphabetically, employing the combinations used by Felt in 1913, or later, and their equivalents in the present revision are given in a corresponding list.

Felt's Names		Equivalents in Present Classification
Campylomyza	*carpini* Felt	*Polyardis carpini* (Felt)
C.	*cerasi* Felt	*Bryomyia gibbosa* (Felt)
C.	*flavoscuta* Felt	*Trichopteromyia modesta* Williston
C.	*gibbosa* Felt	*Bryomyia gibbosa* (Felt)
C.	*modesta* Felt	*Peromyia modesta* (Felt)
C.	*monticola* Felt	*Aprionus monticola* (Felt)
C.	*pomiflorae* Felt	*Campylomyza flavipes* Meigen
C.	*pomifolia* Felt	*Campylomyza flavipes* Meigen
C.	*producta* Felt	*Bryomyia producta* (Felt)
C.	*texana* Felt	*Cordylomyia texana* (Felt)
C.	*truncata* Felt	*Cordylomyia truncata* (Felt)
C.	*vitinea* Felt	*Polyardis vitinea* (Felt)
Ceratomyia	*johannseni* Felt	*Micromya johannseni* (Felt)
Cordylomyia	*americana* Felt	*Cordylomyia texana* (Felt)

Felt's Names		Equivalents in Present Classification
C.	*brevicornis* (Felt)	*Corinthomyia brevicornis* (Felt)
C.	*bryanti* (Felt)	*Corinthomyia brevicornis* (Felt)
C.	*coloradensis* Felt	*Cordylomyia texana* (Felt)
C.	*coprophila* Felt	*Cordylomyia texana* (Felt)
C.	*fulva* Felt	*Cordylomyia fulva* Felt
C.	*kasloensis* (Felt)	*Polyardis kasloensis* (Felt)
C.	*luna* (Felt)	*Corinthomyia brevicornis* (Felt)
C.	*praelonga* Felt	*Cordylomyia fulva* Felt
C.	*scutellata* Felt	*Cordylomyia fulva* Felt
C.	*sylvestris* (Felt)	*Cordylomyia sylvestris* (Felt)
C.	*tumida* Felt	*Corinthomyia brevicornis* (Felt)
C.	*versicolor* (Felt)	*Polyardis carpini* (Felt)
Corinthomyia	*cincinna* Felt	*Corinthomyia brevicornis* (Felt)
C.	*currei* (Felt)	*Corinthomyia brevicornis* (Felt)
C.	*gracilis* Felt	*Corinthomyia brevicornis* (Felt)
C.	*hirsuta* (Felt)	*Corinthomyia brevicornis* (Felt)
Joannisia	*borealis* Felt	*Peromyia borealis* (Felt)
J.	*carolinae* (Felt)	*Peromyia photophila* (Felt)
J.	*flavopedalis* Felt	*Peromyia photophila* (Felt)
J.	*flavoscuta* Felt	*Peromyia photophila* (Felt)
J.	*neomexicana* Felt	*Peromyia neomexicana* (Felt)
J.	*pennsylvanica* Felt	*Peromyia photophila* (Felt)
J.	*photophila* (Felt)	*Peromyia photophila* (Felt)
Monardia	*alexanderi* Felt	*Xylopriona toxicodendri* (Felt)
M.	*articulosa* (Felt)	*Xylopriona articulosa* (Felt)
M.	*balsamicola* (Felt)	*Campylomyza flavipes* Meigen
M.	*barlowi* (Felt)	*Campylomyza fusca* Winnertz
M.	*canadensis* Felt	*Monardia canadensis* Felt
M.	*foliata* Felt	*Cordylomyia texana* (Felt)
M.	*gilletti* (Felt)	*Xylopriona toxicodendri* (Felt)
M.	*illinoiensis* Felt	*Xylopriona toxicodendri* (Felt)
M.	*karnerensis* (Felt)	*Campylomyza flavipes* Meigen
M.	*lateralis* Felt	*Campylomyza flavipes* Meigen
M.	*lignivora* (Felt)	*Monardia lignivora* (Felt)
M.	*modesta* Felt	*Xylopriona toxicodendri* (Felt)
M.	*multiarticulata* Felt	*Monardia multiarticulata* Felt
M.	*pinicorticis* (Felt)	*Aprionus pinicorticis* (Felt)
M.	*populi* (Felt)	*Campylomyza fusca* Winnertz
M.	*rugosa* Felt	*Trichopteromyia modesta* Williston

Felt's Names		Equivalents in Present Classification
M.	*toxicodendri* (Felt)	*Xylopriona toxicodendri* (Felt)
M.	*tuckeri* (Felt)	*Campylomyza dilatata* Felt
Mycophila	*fungicola* Felt	*Mycophila fungicola* Felt
Neptunimyia	*flavida* Felt	*Bryomyia gibbosa* (Felt)
Prionellus	*boulderensis* (Felt)	*Campylomyza boulderi* Felt
P.	*defectiva* (Felt)	*Campylomyza flavipes* Meigen
P.	*dilatata* (Felt)	*Campylomyza dilatata* Felt
P.	*eremi* Felt	*Campylomyza montana* (Felt)
P.	*graminea* (Felt)	*Campylomyza flavipes* Meigen
P.	*hesperia* (Felt)	*Campylomyza flavipes* Meigen
P.	*latipennis* (Felt)	*Campylomyza fusca* Winnertz
P.	*leguminicola* (Felt)	*Campylomyza flavipes* Meigen
P.	*longipennis* (Felt)	*Aprionus longipennis* (Felt)
P.	*monilis* Felt	*Campylomyza dilatata* Felt
P.	*montana* Felt	*Campylomyza montana* (Felt)
P.	*silvana* (Felt)	*Campylomyza silvana* Felt
P.	*simulator* (Felt)	*Campylomyza simulator* Felt
P.	*tsugae* (Felt)	*Campylomyza flavipes* Meigen

Tribe **MICROMYINI** Rondani

Micromyna Rondani, Dipt. Ital. Prod., 1: 198, 1856.

Campylomyzides Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2)8: 48, 1898.

Campylomyzariae Kieffer, Ann. Soc. Ent. France, 69: 451, 1900; Felt, Bull. N. Y. State Mus., 124: 311, 1908; Felt, Jour. N. Y. Ent. Soc., 19: 32, 1911; Felt, Bull. N. Y. State Mus., 165: 153, 1913; Kieffer, Gen. Insect., 152: 287, 1913; Felt, Philip. Jour. Sci., 13 (ser. D): 297, 1918; Felt, Bull. N. Y. State Mus., 257: 136, 1925; Felt, Lingnan Sci. Jour., 7: 425, 1929; Mani, Rec. Ind. Mus., 36, 383, 1935; Mani, Ind. Jour. Ent., 7: 189, 1946.

Campylomyzini Enderlein, Arch. Naturg., 77 (Bd. 1, Suppl. 3): 195, 1911; Enderlein, Zool. Anz., 40: 263, 1912; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 173, 1938.

Campylomyzinae Enderlein, Zool. Anz., 40: 262, 1912; Enderlein, Tierw. Mitteleur., 6 (Lief 2, Teil 3): 61, 1936.

Campylomyzidae Enderlein, Tierw. Mitteleur., 6 (Lief 2, Teil 3): 60, 1936.

Termitomastidae Silvestri, Boll. Mus. Zool. Anat. Comp. Univ. Torino, 16(395): 1, 1901; Silvestri, Redia, 1: 183, 1903.

Termitomastinae Silvestri: Speiser, Zool. Anz., 30: 716, 1906; Brues and Melander, Classif. Insects, pp. 274, 348, 1932; Mani, Ind. Jour. Ent., 7: 190, 1946.

Rondani, in 1856, proposed the stirps MICROMYNA for *Micromya* and related genera. This supergeneric name precedes by many years the use of the genus *Campylomyza* as the type of a supergeneric concept.

The tribe MICROMYINI is a division of the LESTREMIINAE, a subfamily characterized by having the basitarsus longer than the succeeding segment and by having the wing venation not strongly reduced. The tribe MICROMYINI is characterized particularly by the wing venation: M simple; Cu branched near middle of that vein; h absent; Sc_2 absent; CuP fused with Cu; and Pl absent. There are three ocelli, and one or two sclerotized spermathecae are present. Some females are wingless; the latter characters will serve for their tribal recognition.

Wasmaniella Kieffer (1898) was based upon a wingless female specimen. Kieffer and Felt, who studied Kieffer's type, regarded this genus as a close relative of *Campylomyza*. *Wasmaniella* is a valid genus which is here transferred to the tribe LESTREMIINI.

Euprojoannisia Brèthes (1914) was proposed for a single species occurring in Argentina. Brèthes stated that this genus was a member of the LESTREMIINAE. Although no further generic relationships were stated, the name implies a relationship with *Projoannisia* Kieffer, a Micromyine genus which was considered valid at that time. *Euprojoannisia* has not subsequently been mentioned in the literature. Brèthes' description of the genus and of the genotype clearly indicates that this genus should be referred to the HELEIDAE (CERATOPOGONIDAE).

Tricampylomyza Kieffer (1919) has not been recognized since originally described. This genus included a single African species which was based upon a female specimen. This female was characterized as having the eye bridge laterally devoid of facets (or absent), R_1 a little longer than R_s, empodium as long as the claws, palp one segmented, and flagellum composed of eight subellipsoidal, sessile segments, each bearing a pair of peg-like sensoria. *Tricampylomyza* is possibly related to *Micromya*.

Termitomastus Silvestri (1901) was erected for *T. leptoproctus* Silvestri, an inquiline in the subterranean galleries of the termite, *Anoplotermes reconditi* Silv., in Argentina and Brazil. Silvestri recognized the relationships of this species with the ITONIDIDAE, but believed that the presence of ocelli and an eye bridge were sufficient

to distinguish it as a new family. Speiser (1906) placed the category as a subfamily of the Lycoriidae (Sciaridae), while Brues and Melander (1932) and Mani (1946) considered it as a subfamily of the Itonididae. Edwards (1929) recognized the genus as a member of the Micromyini, closely related to the genus *Pezomyia* de Meijere. The original description together with drawings given by Silvestri (1903) indicate that Edwards is correct.

It has been necessary to exclude from consideration *Trichelospatha* Kieffer, *Calospatha* Kieffer, *Stenospatha* Kieffer, and *Tricolpodia* Kieffer. These genera were based on larvae, and the adults are unknown.

Key to Genera (Males)

1. R_5 extending to tip of wing; wing membrane clothed with macrotrichia; genital rod narrow or absent 2
   R_5 ending well before tip of wing; wing membrane devoid of macrotrichia; genital rod very large and massive.
   Acoenonia n. gen.
2. Costa ending abruptly at tip of R_5 or reaching slightly beyond, but not extending halfway from tip of R_5 to M; R_5 with a sensory pore at level of tip of R_1, none on r–m; with a ventral sclerite below the tegmen, the genital rod absent.
   Peromyia Kieffer
   Costa extending well beyond R_5, reaching over halfway of the distance from R_5 to M; with a sensory pore on R_5 proximal to level of end of R_1 or on r–m 3
3. R_1 at least three times the length of R_s; with a sensory pore on R_5, none on r–m; empodium as long as the claws and broad; tarsi without scales 4
   R_1 not over twice the length of R_s, or if longer then empodium absent; with a sensory pore on r–m, none on R_5; empodium narrower, often short or rudimentary, tarsi nearly always with scales, although they are sometimes long and narrow 6
4. Flagellum with small, plate-like sensory processes distally on proximal segments; tegmen divided medio-distally and there provided with dorsal processes.
   Campylomyza Meigen
   Flagellum with only sensory bristles distally on each flagellar segment; tegmen not divided and without medio-dorsal processes 5

5. Flagellar segments each with one complete crenulate whorl of very long bristles; cubital fork forming an acute angle. *Cordylomyia* Felt
   Flagellar segments each with four complete crenulate whorls of rather short bristles; cubital fork forming a nearly right angle ..... *Corinthomyia* Felt
6. Pedicel enlarged; flagellum with seven or eight slender segments, without distinct stems; claws lengthened; cubital fork almost forming a right angle; palpal segments three, the second segment long and slender ..... *Micromya* Rondani
   Pedicel not enlarged; flagellum with eight to thirteen segments, with distinct stems which are sometimes short; cubital fork usually acute angled; palpal segments three or four, the second segment not well differentiated 7
7. Empodium as long as the claws and rather broad; ninth tergum narrow or moderately so; tegmen shield-shaped; disticlasper with distal spine 8
   Empodium rudimentary or short, rarely long and then very narrow and the disticlasper without a distal spine 9
8. Disticlasper with a very strong distal spine or spur; flagellum twelve segmented ..... *Xylopriona* Kieffer
   Disticlasper with a small distal spine; flagellum eleven to thirteen segmented ..... **Polyardis** n. gen.
9. Tegmen laterally with one or more pairs of opposing spines directed inwardly; ninth tergum very broad; genital rod absent; basiclaspers very long, below narrowly united at base ..... *Aprionus* Keiffer
   Tegmen without paired spines 10
10. Flagellum eight- to ten-segmented, the stems short, and each segment with a single crenulate row of bristles; disticlasper with distal spine; genital rod absent ..... *Mycophila* Felt
    Flagellum twelve-segmented, the stems long 11
11. Genital rod long, not modified 12
    Genital rod with proximal portion very short, distally forming a pair of long, divergent processes which are usually lightly pigmented; disticlasper without terminal spine; ninth tergum broad ..... *Bryomyia* Kieffer
12. Eye bridge six facets wide ..... *Trichopteromyia* Williston
    Eye bridge not over four to five facets wide ..... *Monardia* Kieffer

Key to Genera (Females)

1. Costa extending well beyond R_5, reaching over halfway of distance from R_5 to M; with a sensory pore on R_5 proximal

to level of tip of R_1 or on r–m (sometimes brachypterous or apterous) 2

Costa ending abruptly at tip of R_5 or extending slightly beyond, but not extending halfway from tip of R_5 to M; with a sensory pore on R_5 at level of tip of R_1, none on r–m; spermathecae two; flagellar segments with globular nodes and long stems ..... *Peromyia* Kieffer

2. R_1 at least three times as long as R_s; with a sensory pore on R_5, none on r–m; tarsi without scales; empodium as long as claws and broad 3

R_1 not over twice the length of R_s, or if longer then empodium rudimentary; with a sensory pore on r–m, none on R_s; tarsi nearly always with scales, although they are sometimes long and narrow; empodium narrower, often short or rudimentary (sometimes brachypterous or apterous) 5

3. Flagellar segments each with a distal sensory collar; spermatheca one ..... *Campylomyza* Meigen

Flagellar segments each with distal sensory spines only; spermathecae two, although one may be very small 4

4. Spermathecae two, alike in size and pigmentation; flagellar segments longer than broad; cubital fork acute angled. *Cordylomyia* Felt

Spermathecae two, one large and lightly pigmented, the other very small and darkly pigmented; cubital fork forming a wide angle ..... *Corinthomyia* Felt

5. Spermatheca one 6

Spermathecae two 9

6. Flagellar segments each with only one or two sensory processes distally which arise from a number of small pores 7

Flagellar segments each with four or more sensory processes distally or with sensory bristles only 8

7. Cubital fork forming almost a right angle; flagellar segments each with a distal sensory collar or ring which is interrupted on one side or both sides ..... *Micromya* Rondani

Cubital fork forming an acute angle; flagellar segments each with a pair of plate-like sensory processes which are broad and distally more or less lobed ..... *Mycophila* Felt

8. Empodium as long as the claws and rather broad; flagellar segments each with sensorial bristles distally or with awl-like or disc-like processes ..... **Polyardis** n. gen.

Empodium rudimentary or half as long as the claws and very

narrow; flagellar segments each with four or more processes which are slender or broad, sometimes digitate. *Aprionus* Kieffer

9. Flagellum with each segment provided with only two sensory processes which are slender and sometimes digitate, each arising from a single pore ..... *Bryomyia* Kieffer

Flagellum with each segment provided with four (rarely three) sensory processes or with sensory bristles only 10

10. Empodium as long as the claws, rather broad. *Xylopriona* Kieffer

Empodium rudimentary 11

11. Eye bridge six facets wide; spermathecae somewhat retort-shaped; sensory processes of flagellum disc-like, each with a long distal projection ..... *Trichopteromyia* Williston

Eye bridge not over four to five facets wide; spermathecae rounded or pear-shaped; flagellar sensoria disc-like or plate-like, rarely with a distal projection. *Monardia* Kieffer

Acoenonia n. gen.

Genotype.—*Acoenonia perissa* n. sp.

The genus *Acoenonia* is widely divergent from all other genera included in the MICROMYINI. *Acoenonia* is distinctive particularly because of the abbreviated R_5 which reaches the costa well before the end of the wing, the absence of macrotrichia on the wing membrane, the complete lack of eye bridges laterally, and the very massive genital rod of the male hypopygium. The medial vein is simple and the cubital vein is forked, thus indicating relationships with the MICROMYINI. *Acoenonia* embodies certain features of the LESTREMIINI. The vestiture of the tarsi is the same as in that tribe, consisting only of short bristles of about the same length, and the tenth tergites of the male hypopygium are strongly developed as in that tribe.

Ocelli three, large. Eyes bare as usual; eye bridge widely and entirely absent laterally; mediodorsal portion of the eyes about five facets wide along median line; lateral portion of eye with a small lobe above at posterior angle. Antenna of male with two plus twelve segments, the flagellar segments stemmed, and each enlargement with a whorl of bristles. Palpus short, three segmented. Occipito-orbitals very short (they are usually long and strong in the MICROMYINI). Legs short; tibia

without distal spurs as usual; first tarsal segment as long as following three segments; claws with a median, angulate projection; empodia rudimentary. Wings (Plate 1, fig. 1) broadly rounded, densely clothed with microtrichia, more densely so on veins, the veins not being otherwise well outlined, and with a sparse row of setae on R, R_1, and R_5; C reaching well beyond R_5, but not reaching apex of wing; costal cell narrow; Sc short, evanescent distally; h absent; R_1 gradually coalescent with costa near middle of wing, containing two sensory pores (only one pore evident on one wing); R_s somewhat shorter than R_1, slightly oblique, containing a sensory pore on lower portion; R_5 gradually coalescent with costa at three-fourths length of wing, with a sensory pore just beyond R_s; r–m about four times length of R_s; M simple, reaching apex of wing; Cu forked near middle, the angle moderately acute; Cu_2 evanescent on distal fourth. Hypopygium with ninth tergal portion membranous; tenth tergites a pair of well-developed lobes, tegmen well developed; genital rod exceedingly large.

Acoenonia perissa n. sp.

Male.—A small, dark brownish species, with light brownish wings. Flagellum with stems of middle segments about two-thirds length of enlargements, shorter on proximal and distal segments; penultimate segment without stem; twelfth segment rather small; each enlargement with a proximal whorl of setae, a median crenulate (but not obviously so) whorl of long bristles set moderately wide apart, and with a few long and very short bristles distally. Palp with first segment short, and the second and third segments successively decreasing in size; first and second segments with a few long sensorial bristles inside. Mesonotum with dorso-central and lateral bristles; scutellum with four pairs of marginal bristles. Abdomen membranous, without sclerites, although the segmental interstices are sclerotized. Hypopygium (Plate I, fig. 6) with ninth tergal portion membranous; tenth tergites a pair of well developed, angulate lobes beyond the tenth segment; basiclaspers well developed, broadly united below, each with a small angulation inside and above, and below strongly and angulately produced; disticlasper cuspidate distally, with a rather narrow, dorsal flange on the inside extending proximally to a large proximo-dorsal angulate lobe which bears a wide flange; basiclasper roots distally connected by a long, transverse bridge; tegmen rather broad, with strong

proximo-ventral roots, distally with a narrow hyaline cap and with a large, attenuated, membranous sheath bearing small, anteriorly directed teeth. Length of wing, 1.2 mm.

Holotype.—Male, Anoka, Minnesota, August 30, 1941, A. E. Pritchard, at the University of Minnesota.

The single male of this striking species was taken near a marshy area in the woods along Coon Creek.

Genus *Campylomyza* Meigen

Campylomyza Meigen, System. Beschr. Bekann. Eur. Zweifl. Insekt., 1: 101, 1818; Meigen, System. Beschr. Bekann. Eur. Zweifl. Insekt., 6: 271, 1830; Macquart, Hist. Nat. Insect., 1: 150, 1834; Westwood, Introd. Classif. Insect., Gen. Syn., p. 126, 1840; Loew, Dipt. Beitr., 4: 12, 21, 1850; Zetterstedt, Dipt. Scand., 9: 3669 (misspelled as *Campylomyia*), 1850; Walker, Insect. Brit., Dipt., 3: 61, 1856; Schiner, Faun. Austr., Flieg., 2: 411, 1864; Winnertz, Verh. Zool.-Bot. Ges. Wien, 20: 9, 1870; van der Wulp, Dipt. Neerl., p. 75, 1877; Skuse, Proc. Linn. Soc. N. S. Wales, 3: 133, 1889; Kieffer, Misc. Ent., 3: 112, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 50, 1898; Kieffer, Ann. Soc. Ent. France, 69: 437, 1900; Felt, Bull. N. Y. State Mus., 124: 313, 1908; Felt, Jour. N. Y. Ent. Soc., 19: 34, 1911; Enderlein, Arch. Naturg., 77 (Bd. 1, Suppl. 3): 195, 1911; Felt, Bull. N. Y. State Mus., 165: 164, 1913; Kieffer, Gen. Insect., 152: 296, 1913; Edwards, Encycl. Ent., 9 (ser. B, 2 Dipt.): 47, 1938; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 174, 1938.

Neurolyga Rondani, Sopra Alc. Gen. Inset. Ditt., Mem. Sec. Serv. Ditt. Ital., p. 22, 1840 (review in Isis von Oken, 1844: 451, 1844); Rondani, Nuov. Ann. Sci. Nat. Bologna, (ser. 2) 6: 373, 1846; Rondani, Dipt. Ital. Prod., 1: 199, 1856; Kieffer, Ann. Soc. Ent. France, 69: 442, 1900.

Prionota Kieffer (not van der Wulp, 1885, Tipulidae), Bull. Soc. Ent. France, 1894: clxxvi, 1894.

Prionella Kieffer (not Robineau-Desvoidy, 1830, "Trypetidae"), Wien. Ent. Ztg., 13: 205, 1894. New synonymy.

Prionellus Kieffer (new name for *Prionota* Kieffer), Misc. Ent., 3: 91, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 49, 1898; Felt, Jour. N. Y. Ent. Soc., 19: 34, 1911; Enderlein, Arch. Naturg., 77 (Bd. 1, Suppl. 3): 196, 1911; Felt, Bull. N. Y. State Mus., 165: 172, 1913; Kieffer, Gen. Insect., 152: 290, 1913; Edwards, Encycl. Ent., 9 (ser. B, 2 Dipt.): 49, 1938.

Amblyspatha Kieffer, Marcellia, 12: 52, 1913; Kieffer, Gen. Insect., 152: 299, 1913; Edwards, Encycl. Ent., 9 (ser. B, 2 Dipt.): 49, 1938.

Cylophora Kieffer, Marcellia, 12: 55, 1913; Kieffer, Gen. Insect., 152: 299, 1913; Edwards, Encycl. Ent., 9 (Ser. B, 2 Dipt.): 49, 1938.

Genotype.—By subsequent designation of Westwood, 1840, *Campylomyza flavipes* Meigen.

Genotypes of synonyms and homonyms.—*Neurolyga:* by subsequent designation of Rondani, 1856, *Neurolyga fenestralis* Rondani; *Prionota:* monobasic (the second species was questionably included), *Prionota pini* Kieffer; *Prionella:* based on larva, no species included or mentioned, *Prionota pini* Kieffer, by present designation (*Prionella* was apparently a new name for *Prionota*, but this spelling was not subsequently mentioned); *Prionellus: ipso facto, Prionota pini* Kieffer; *Amblyspatha:* by subsequent designation of Edwards, 1938, *Amblyspatha ormerodi* Kieffer; *Cylophora:* monobasic, *Cylophora fasciata* Kieffer.

The genus *Campylomyza* may be recognized by having R_1 long, the empodium long and broad, the eye bridge widely devoid of facets on either side, the male flagellar segments each with two complete and one incomplete whorls of long bristles and with a pair of small plate-like sensoria distally, the female flagellar segments each with a sensorial collar distally and the first segment with a pair of shallow sensory pockets, and the female with a single spermatheca. The male genitalia are characteristic, the ninth tergum being narrow, the basiclaspers rather narrowly united below, the roots of the basiclasper convergent and with the distal ends united, the tegmen divided above with a pair of mediodorsal processes, and the genital rod with a characteristic enlargement distally.

Neurolyga Rondani must be considered a synonym of *Campylomyza* Meigen. *Campylomyza* was originally described as having sixteen antennal segments in the male. Rondani did not recognize *Campylomyza* in his own material and considered *Neurolyga* distinct from Meigen's genus on a basis of fifteen antennal segments in the male. Edwards has shown that Meigen erred, since Meigen's type males had fourteen segments; Rondani also could have erred. Fifteen antennal segments are unusual in the males of the Micromyine genera, and this number is not known to occur in combination with four palpal segments, except in *Peromyia* where the fourteenth segment is binodose. Edwards pointed out that Felt (and Mani)

was incorrect in considering *Neurolyga* a probable synonym of *Peromyia,* because *Neurolyga* was described as having the flagellar segments of the female scarcely petiolate. The best clue as to the identity of *Neurolyga* lies in Rondani's redescription of the genus (1846) in which he notes that R_1 is much longer than in *Micromya.* The wing venation, together with the description of the palpi and antennae of both sexes, presents strong evidence for synonymy of *Neurolyga* with *Campylomyza.*

The genus *Urosema* Kieffer was based upon a female specimen the description of which corresponds to a female of *Campylomyza,* except that the ovipositor was said to be large and densely hairy above. A Japanese species, *Urosema mori* Sasaki, injurious to mulberry was later referred to this genus by Sasaki. Edwards considered *Urosema* to be a probable synonym of *Campylomyza,* but the two genera should be considered distinct until *Urosema* is more definitely recognized and characterized.

Four species of *Campylomyza* are here recognized from North America, although a number of others are probably represented in this region. Three of these species are common in both Europe and the United States. The males may be readily recognized by the genital characters. There are variations in the orientation of the tegmen of mounted specimens which cause considerable differences in the appearance of this structure, and this must be taken into consideration. There is some variation in the length of the flagellar stems of the male of a species, particularly of the penultimate segment. The female of *fusca* may be readily recognized, but the females of the other species are difficult to recognize with certainty at the present time. There definitely is a variation in the number of flagellar segments in the female of a species, and there is also some variation in the shape of the wing. The proportional lengths of the palpal segments of a species is subject to variation. Edwards has attempted to use the form of the distal segments of the anterior tarsus of the female for species diagnosis, but, while this is a valuable character, it is often difficult to appreciate. Felt has described three species of *Campylomyza* based on the female sex, which cannot be definitely recognized at the present time.

Campylomyza scutellata Say cannot be recognized from the description, and the type has been lost.

The species of *Campylomyza* are commonly found in yards, gardens, cultivated fields, and along roadsides, as well as in the woods. The males are sometimes found flying in swarms. *C. dila-*

tata emerged from a vial containing vegetable matter and seeds, in Massachusetts, and was reared from a cage sown with oats, in Texas. *C. ormerodi* (Kieffer), is said to be a widespread pest on the roots of red clover in England. Winnertz, in Germany, reared a number of forms belonging to *Campylomyza* from rotten wood and also from mushrooms.

Key to North American Species (Males)

1. Basiclasper produced into a long distal arm inside and above; ninth tergum angulate, the sides convergent distally; disticlasper broadened and rather truncate distally. *dilatata* Felt

   Basiclasper without a long distal arm; ninth tergum broadly truncate distally; disticlasper not broadened and truncate distally 2

2. Disticlasper attenuated distally; tegminal median processes forming a long acute angulation directed anteriorly. *montana* (Felt)

   Disticlasper broadly rounded distally 3

3. Tegminal median processes composed of rounded, lamellate loops; basiclasper with distal end somewhat produced inside and above ..... *fusca* Winnertz

   Tegminal median processes not lamellate, but forming an angle directed anteriorly; basiclasper not produced at distal end inside ..... *flavipes* Meigen

Campylomyza flavipes Meigen

Campylomyza flavipes Meigen, System. Beschr. Bekann. Eur. Zweifl. Insekt., 1: 101, 1818; Edwards, Encycl. Ent. (Dipt.), 9 (Ser. B 2): 50, 1938; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 175, 1938 (fig. head, male genitalia, female abdomen, male and female antennae, distal end of anterior tarsus of female, wings, palp).

Campylomyza fuscipes Meigen, System. Beschr. Bekann. Eur. Zweifl. Insekt., 1: 101, 1818; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 176, 1938 (fig. male genitalia, distal end of male antenna).

Campylomyza aceris Meigen, System. Beschr. Bekann. Eur. Zweifl. Insekt., 1: 101, 1818.

Campylomyza aequalis Winnertz, Verh. Zool.-Bot. Ges. Wien, 20: 12, 1870.

Campylomzya leguminicola Felt, Bull. N. Y. State Mus., 110:

98, 1907; Felt, Bull. N. Y. State Mus., 124: 315, 1908. New synonymy.

Prionellus leguminicola (Felt): Felt, Bull. N. Y. State Mus., 165: 181, 1913 (fig. distal tarsal segment).

Campylomyza graminea Felt, Bull. N. Y. State Mus., 110: 98, 1907; Felt, Bull. N. Y. State Mus., 124: 315, 1908. New synonymy.

Prionellus graminea (Felt): Felt, Bull. N. Y. State Mus., 165: 180, 1913 (fig. male antennal segments, palp).

Campylomyza balsamicola Felt, Bull. N. Y. State Mus., 110: 99, 1907; Felt, Bull. N. Y. State Mus., 124: 315, 1908. New synonymy.

Monardia balsamicola (Felt): Felt, Bull. N. Y. State Mus., 165: 189, 1913 (photogr. male genitalia).

Campylomyza pomiflorae Felt, Bull. N. Y. State Mus., 110: 99, 1907; Felt, Bull. N. Y. State Mus., 124: 315, 1908; Felt, Bull. N. Y. State Mus., 165: 168, 1913 (photogr. male genitalia). New synonymy.

Campylomyza tsugae Felt, Bull. N. Y. State Mus., 110: 101, 1907; Felt, Bull. N. Y. State Mus., 124: 314, 1908. New synonymy.

Prionellus tsugae (Felt): Felt, Bull. N. Y. State Mus., 165: 176, 1913 (fig. female genitalia, palp, distal tarsal segments).

Campylomyza karnerensis Felt, Bull. N. Y. State Mus., 110: 101, 1907; Felt, Bull. N. Y. State Mus., 124: 315, 1908. New synonymy.

Monardia karnerensis (Felt): Felt, Bull. N. Y. State Mus., 165: 188, 1913 (photogr. male genitalia).

Campylomyza defectiva Felt, Bull. N. Y. State Mus., 124: 314, 1908. New synonymy.

Campylomyza defectiva (Felt): Felt, Bull. N. Y. State Museum, 165: 174, 1913.

Campylomyza pomifolia Felt, Bull. N. Y. State Mus., 124: 315, 1908; Felt, Bull. N. Y. State Mus., 165: 167, 1913 (photogr. male genitalia). New synonymy.

Campylomyza hesperia Felt, Bull. N. Y. State Mus., 124: 315, 1908. New synonymy.

Prionellus hesperia (Felt): Felt, Bull. N. Y. State Mus., 165: 181, 1913 (photogr. male genitalia).

Prionellus monilis Felt (not Felt, 1913), Jour. Econ. Ent., 8: 405, 1915. New synonymy.

Campylomyza flavipes is a common and widespread species in both Europe and the United States. Edwards has very adequately redescribed and illustrated this species after studying Meigen's type.

The male of *flavicipes* is characterized by having the ninth tergum broadly truncate, the basiclaspers unmodified distally, the disticlaspers broadly rounded distally, and the tegmen with a pair of angulations medio-distally and with a pair of characteristic medio-dorsal processes which have anteriorly directed angles. Felt described eight species based on male specimens which are essentially identical. Differences in the orientation of the tegmen in the mounts of these specimens cause somewhat different proportions in some cases. The genitalia may be mounted to give a completely dorsal view of the tegminal processes, or the tegmen may be tilted until a posterior view of these processes is obtained. Likewise, differences in orientation may cause the caudo-lateral lobes of the tegmen to appear elongate, extending beyond the level of the medio-distal angulations or to appear broadly obtuse and not extending to the level of the medio-distal angulations; the medio-distal angulations may appear more divergent in some cases than in others. The male genitalia of the monotypes of *leguminicola, karnerensis, lateralis, balsamicola,* and *graminea* are upside down and appear similar, having the tegmen broadly rounded caudo-laterally, the medio-distal angles divergent. The male genitalia of the types of *pomifolia* are right side up, with the caudo-lateral angles forming elongate lobes, the medio-distal angles approximate. The types of *pomiflorae* are right side up, with the caudo-lateral lobes somewhat variable, the medio-distal angles divergent. The genitalia of the types of *herperia* are right side up, one appearing as in *leguminicola,* the other as in *pomifolia.* There are no significant differences in the proportional lengths of the stems of the flagellar segments of these types, and the length of the stem of the penultimate flagellar segment is very variable. The stem of the fifth antennal segment is one-half as long as the proximal enlargement in all of these types except in the monotype of *graminea* and one cotype each of *pomifolia* and *pomiflorae* where it is slightly longer.

The female of *flavipes* is difficult to recognize with certainty. The monotype females of *defectiva* and *tsugae* are essentially identical. The antennae of *tsugae* are badly crumpled, but the eleventh flagellar segment is connate to the penultimate segment exactly as in *defectiva* (Felt separated these females on a basis of a difference of number of antennal segments). The collars of the flagellar seg-

ments appear to be low on one side in both cases, and do not seem to be incised in the *defectiva* female. The legs of these two females are short and hairy, with the fifth segment of the fore tarsus slightly longer than the fourth and slightly larger, the fourth being about one and one-half times as long as broad. The radial and cubital veins are moderately well defined. These females thus agree with the *flavipes* female as described and figured by Edwards. The *defectiva* female was taken in association with the *hesperia* males, and the *tsugae* female was taken in association with the *balsamicola* male. It thus seems reasonable to consider these females as representing *flavipes*.

Edwards recognized *fuscipes* Meigen as a possibly distinct form which differed slightly from *flavipes* in having darker legs, the stem of the penultimate flagellar segment of the male shorter, and the ultimate flagellar segment of the female longer. This form is not worthy of specific rank, since these characters are shown by the series at hand to be variable in nature.

Type.—Female, at the Paris Museum.

Types of synonyms.—*Fuscipes:* type male (head and abdomen missing), at the Paris Museum; *aceris:* type male (lacking head), at the Paris Museum; *aequalis:* type male(s), at the University of Bonn; *leguminicola:* monotype male, at the New York State Museum; *graminea:* monotype male, at the New York State Museum; *balsamicola:* monotype male, at the New York State Museum; *pomiflorae:* lectotype male, by present designation, at the New York State Museum; *tsugae:* monotype female, at the New York State Museum; *karnerensis:* monotype male, at the New York State Museum; *defectiva:* monotype female, at the New York State Museum; *pomifolia,* lectotype male, by present designation, at the New York State Museum; *hesperia:* lectotype male, by present designation, at the New York State Museum.

Specimens examined.—Indiana: one male, Lafayette, April 21, winter wheat (determined as *monilis* by Felt); seven males, seven females (all on cardpoints), April 27 and May 1, J. M. Aldrich, swept from winter wheat (in the U. S. National Museum, determined by Felt as *?monilis*); one male, one female, May 1 [1914, J. M. Aldrich] swept from winter wheat (recorded and male described as *monitis* by Felt). Massachusetts: one male, Boston, May 10, Owen Bryant (monotype of *lateralis,* labelled *"lateris"*). Minnesota: three males, Afton, May 10, 1941, A. E. Pritchard; one male, Alexandria, June 23, 1941, A. E. Pritchard; one male, Anoka, April 26, 1941, A. E. Pritchard; one male, Baudette, October 8,

1941, D. G. Denning; three males, Campbell, October 15, 1941, D. G. Denning; eight males, one female, Ft. Snelling, April 27, 1941, A. E. Pritchard; one male, southeast corner Houston Co., May 31, 1941, A. E. Pritchard; one male, St. Paul, May 4, 1941, A. E. Pritchard; three males, three females, St. Paul, April 23–28, 1942, A. E. Pritchard and D. G. Denning. New York: one male, Albany, June 4, 1906 (monotype of *leguminicola*); one male, East Schodack, May 15, 1907 (undetermined by Felt); one male, Karner, April 27, 1906 (monotype of *graminea*); four males, Karner, May 14, 1906 (lectotype and paralectotypes of *pomiflorae*); one male, Karner, May 16, 1906 (monotype of *karnerensis*); one male, Lake Clear, June 7, 1906 (monotype of *balsamicola*); one female, Lake Clear, June 7, 1906 (monotype of *tsugae*); two males (and one extra head), Nassau, May 6, 1902 (lectotype and paralectotype of *pomifolia*); one male, Nassau (determined by Felt as *pomifolia*); two males, Nassau (undetermined by Felt); two males, Newport, July 27, 1906 (lectotype and paralectotype of *hesperia*); one female, Newport, July 27, 1906 (monotype of *defectiva*).

Campylomyza montana (Felt), new combination

Prionellus montana Felt, Bull. N. Y. State Mus., 165: 182, 1913.
Prionellus eremi Felt, Ent. News, 30: 219, 1919. New synonymy.

Campylomyza montana is known only from two males taken in Boulder Co., Colorado. *Montana* is closely related to *flavipes* from which it differs in the male sex by having the disticlasper rather strongly attenuated on the distal half and the angulate dorsal processes of the tegmen each with the anteriorly directed angulation long, very acute, heavily scleroterized, and the inner side of the process strongly enlarged near its origin.

The male genitalia of the monotype of *eremi* are askew and distorted, but are similar to that of the monotype of *montana*. Felt did not regard *eremi* as a close relative of *montana*, because the stem of the fifth antennal segment appears slightly shorter in the former species. The antennae of the *eremi* male are somewhat shrivelled, and this apparent difference cannot be considered significant. The stem of the penultimate flagellar segment is considerably longer in the *montana* male than in the *eremi* male, but this character is known to be quite variable in closely related species. Felt also attached significance to the long fourth palpal segment of *eremi*, but in the monotype specimen this segment is considerably shorter on one side than the other.

This species appears to be the same as that described by Edwards as *C. strobli* (Kieffer). It is the opinion of the writer, however, that the identification of the female of *montana* should be definitely established before Kieffer's name is applied in this country, since the type of *strobli* is a female. It might be mentioned that the female described as *boulderi* Felt, which is from the same locality as the types of *montana* and *eremi*, does not agree very well with Edwards' description of the type of *strobli*.

Monotype.—Male, at the New York State Museum.

Types of synonyms.—*Eremi:* monotype male, at the New York State Museum.

Specimens examined.—Colorado: one male [Boulder, April 25, 1909] Cockerell (monotype of *montana*); one male, Brainard Lake, August 28, T. D. A. Cockerell (monotype of *eremi*).

Campylomyza fusca Winnertz

Campylomyza fusca Winnertz, Verh. Zool.-Bot. Ges. Wien, 20: 12, 1870; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 179, 1938 (fig. male genitalia, distal ends of male and female antennae).

Campylomyza populi Felt, Bull. N. Y. State Mus., 110: 98, 1907; Felt, Bull. N. Y. State Mus., 124: 315, 1908.

Monardia populi (Felt): Felt, Bull. N. Y. State Mus., 165: 189, 1913 (photogr. male genitalia).

Campylomyza latipennis Felt, Bull. N. Y. State Mus., 124: 314, 1908. New synonymy.

Prionellus latipennis (Felt): Felt, Bull. N. Y. State Mus., 165: 179, 1913 (photogr. wing).

Campylomyza barlowi Felt, Bull. N. Y. State Mus., 124: 316, 1908. New synonymy.

Monardia barlowi (Felt): Felt, Bull. N. Y. State Mus., 165: 190, 1913.

Prionellus boulderensis (Felt) in part: Felt, Bull. N. Y. State Mus., 165: 177, 1913. New synonymy.

Campylomyza fusca is apparently a common species in both Europe and North America. Edwards first recognized that *Monardia populi* (Felt) is a synonym of *fusca*.

The male of *fusca* may be recognized by having the ninth tergum broadly truncate distally, the basiclasper distally with a rather broadly angulate development above and inside, the disticlasper broadly rounded distally, and the tegmen medio-distally with a pair of angulations and medio-dorsally with a pair of curved lamellate

processes formed of concentric layers. The tegmen is often tilted with the distal end down, and the tegminal processes then appear scalloped above and laterally attenuated. The three males representing *Prionellus latipennis* (Felt), *Monardia barlowi* (Felt), and *M. populi* (Felt) all have genitalia of the typical form, those of *populi* being ventral view.

The female of *fusca* may be easily recognized by the presence of a small, nearly geminate, heavily pigmented plate which is located below the distal end of the oviduct and just above the medio-distal division of the ninth sternum (Plate 1, fig. 2). The taxonomic significance of this plate in the ovipositor is borne out by its presence in four females from Minnesota and one female from New York (paralectotype of *latipennis*), all of which were taken in copulation with males of *fusca*. The flagellar segments of the female vary in number from ten to twelve, and the length of the knob distal to the terminal segment is variable. The length of the fourth palpal segment varies from one to two times the length of the third.

The wings of *fusca* usually have the radial veins heavily pigmented and the cubital veins very lightly pigmented.

Type.—Male(s), at the University of Bonn.

Types of synonyms.—*Populi:* monotype male, at the New York State Museum; *latipennis:* lectotype male, by present designation, at the New York State Museum; *barlowi:* monotype male, at the New York State Museum.

Specimens examined.—COLORADO: one female, Boulder, T. D. A. Cockerell (determined by Felt as *boulderensis*). MINNESOTA: one male, Afton, May 18, 1941, A. E. Pritchard; five males, Baudette, October 8, 1941, D. G. Denning; ninety-five males, six females, Campbell, October 15, 1941, D. G. Denning; fifty-six males, two females, Ft. Snelling, April 27, 1941, A. E. Pritchard; five hundred and two males, nine females, Hallock, May 23, 1938, A. E. Pritchard; two males, Hallock, May 5, 1941, H. P. Nicholson; six males, sixteen females, Little Falls, May 3, 1938, A. E. Pritchard; ten males, three females, Parkers Prairie, September 29, 1941, D. G. Denning; one male, one female, Pine City, May 3, 1941, A. E. Pritchard; one female, St. Paul, April 25, 1938, A. E. Pritchard, at light; four males, three females, St. Paul, April 23–28, 1942, A. E. Pritchard and D. G. Denning; eleven males, three females, Tenney, June 19, 1941, A. E. Pritchard. NEW YORK: one male, Albany, June 4, 1906 (monotype of *populi*); one male, one female, Karner, April 28, 1907 (lectotype and paralectotype of *latipennis*). OREGON: one female, Corvallis, May 18, 1896 (recorded by Felt as *boulderensis;* retained in the Felt collection, and not in the U. S. National

Museum). Rhode Island: one male, Kingston, May 2, 1904 (monotype of *barlowi*); one male (on cardpoint), Kingston, April 2, 1904 (determined by Felt as *barlowi*). Washington: eight males, Spokane, May 6, 1940, J. Standish. Alberta: three males, Cowdrey (one labelled "Cowley"), July 16, 1913, F. H. Strickland (determined as *?populi* by Felt). Manitoba: one male, Aweme, July 11, 1907, N. Criddle (undetermined by Felt).

Campylomyza dilatata Felt

Campylomyza dilatata Felt, Bull. N. Y. State Mus., 110: 149, 1907; Felt, Bull. N. Y. State Mus., 124: 316, 1908.

Prionellus dilatata (Felt): Felt, Bull. N. Y. State Mus., 165: 178, 1913.

Campylomyza tuckeri Felt, Bull. N. Y. State Mus., 124: 316, 1908. New synonymy.

Monardia tuckeri (Felt): Felt, Bull. N. Y. State Mus., 165: 190, 1913.

Prionellus monilis Felt, Bull. N. Y. State Mus., 165: 175, 1913. New synonymy.

Campylomyza lobata Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 181, 1938. New synonymy.

Campylomyza dilatata is a widespread species in the United States and is very common in Minnesota. Edwards has recently described this species from England as *C. lobata* and stated that it is widespread and common in that country.

The male of *dilatata* may be easily recognized by the genitalia which are characterized by having the basiclaspers each with a long lobe distally and inside, the ninth tergite convergent between the basiclasper lobes, the disticlasper enlarged and rather truncate distally, and the tegmen disto-medially with three pairs of strong teeth. The male monotype of *Monardia tuckeri* (Felt) agrees entirely with the male lectotype of *Prionellus dilatata* (Felt).

The female of *dilatata* is difficult to recognize. The monotype female of *Prionellus monilis* Felt was taken at the same locality and during the same month as the monotype male of *tuckeri*. It is identical with the paralectotype female reared with the lectotype male of *dilatata*. Felt separated the females representing *dilatata* and *monilis* by considering the antenna of one female thirteen-segmented and the antenna of the other female twelve-segmented with the last segment double. In both of these females, as well as in the other two females which were taken in copulation with *lobata* males, the terminal segment of the fore tarsus is distinctly longer

than the penultimate segment and is not enlarged; the fourth segment is nearly twice as long as broad. The radial and cubital veins are similarly rather lightly pigmented. A series of females have been collected in Minnesota which probably represent this species, but these records are not included due to lack of certainty of the identification.

Felt's subsequent record of *monilis* and description of the male sex was based upon a misidentification (see *C. flavipes*).

The Felt collection contains two males, three females which are correctly determined as *dilatata*. With reference to these specimens, the accession book data are, "Collected by Mr. Hart, October 10, 1918. Supposed to be wheat midge. Forwarded by Dr. J. J. Davis, 1919."

One male in the Felt collection from Hazelton, Pennsylvania, May 11, 1910, Dietz (determined by Felt as *Monardia ?barlowi* Felt) is similar to *dilatata* except that the basiclasper lobes are shorter, the ninth tergum is wider distally, the tegmen bears a pair of long angulations medio-distally, and the mediodorsal tegminal process appear laminate. This male probably represents a different species.

Lectotype.—Male, by present designation, at the New York State Museum.

Types of synonyms.—*Tuckeri:* monotype male, at the New York State Museum; *monilis:* monotype female, at the New York State Museum; *lobata:* type male, at the British Museum (Natural History).

Specimens examined.—Massachusetts: one male, one female [Worcester] Thompson [reared from vial containing decaying vegetable matter and seeds] (lectotype and paralectotype of *dilatata*). Minnesota: nine males, Anoka, April 26, 1941, A. E. Pritchard; nine males, six females, Baudette, October 8, 1941, D. G. Denning; ninety-three males, Campbell, October 15, 1941, D. G. Denning; one hundred and twenty-seven males, six females, Hallock, May 23, 1938, A. E. Pritchard; six males, twelve females, Hallock, May 5, 1941, H. P. Nicholson; two males, Parkers Prairie, September 29, 1941, D. G. Denning; one male, St. Paul, March 23, 1937, A. E. Pritchard; one male, St. Paul, May 7, 1941, A. E. Pritchard; one male, Starbuck, October 21, 1941, D. G. Denning; eight males, four females, Tenney, June 19, 1941, A. E. Pritchard. New York: one male, Nassau (undetermined by Felt). North Dakota: two males, Ellendale, April 28, 1939, D. G. Denning. Texas: one male, Plano, November, 1907 [E. S. Tucker] (monotype of *tuckeri*); one female,

Plano, November, 1907 [E. S. Tucker, reared from cage sown with oats] (monotype of *monilis*).

Campylomyza boulderi Felt

Campylomyza boulderi Felt, Bull. N. Y. State Mus., 124: 314, 1908.

Prionellus boulderensis (Felt) in part: Felt, Bull. N. Y. State Mus., 165: 177, 1913 (emended spelling of specific name).

C. boulderi is represented by a single female specimen since the specimen later recorded by Felt is not conspecific. This monotype female cannot be readily distinguished from other females and cannot be definitely associated with any male at the present time. *C. boulderi* differs from the female of *flavipes* and *strobli* in having the distal segments of the anterior tarsus longer and slenderer, the fourth and fifth segments each being about twice as long as broad, and the fifth segment not enlarged. *Boulderi* is very similar to the female of *dilatata,* but appears to differ in having R_1 longer, nearly four times the length of R_s, the anal lobe more broadly rounded, and it is larger. There is no ventral plate in the ovipositor.

Monotype.—Female, at the New York State Museum.

Specimens examined.—Colorado: one female, Boulder, October 15, 1907 [T. D. A. Cockerell] (monotype of *boulderi*).

Campylomyza simulator Felt

Campylomyza simulator Felt, Bull. N. Y. State Mus., 124: 314, 1908.

Prionellus simulator (Felt): Felt, Bull. N. Y. State Mus., 165: 175, 1913.

Campylomyza simulator is represented by a single female specimen which is not easily differentiated from other females nor definitely associated with the male sex. It is possible, however, that this represents a female of *dilatata.* The penultimate segment of the anterior tarsus is twice as long as broad, the ultimate segment slightly longer and scarcely enlarged. R_1 is about three times the length of R_s; the cubital veins are somewhat paler than the radial veins. There are ten flagellar segments, the ninth segment without a distal neck.

Monotype.—Female, at the U. S. National Museum.

Specimens examined.—British Columbia: one female, Kaslo, June 22 (not 26) [R. P. Currie] (monotype of *simulator*).

Campylomyza silvana Felt

Campylomyza silvana Felt, Bull. N. Y. State Mus., 124: 314, 1908.

Prionellus silvana (Felt): Felt, Bull. N. Y. State Mus., 165: 174, 1913.

Campylomyza silvana is represented by a single female specimen which cannot be easily differentiated from other females nor definitely associated with the male sex at the present. This female closely resembles the monotype female of *boulderi*. The fourth and fifth segments of the anterior tarsus are subequal in length, each slightly over twice as long as broad; the fifth segment is not enlarged; R_1 is about four times the length of R_s; and the anal lobe is not broadly rounded. There are ten flagellar segments, the ninth without a distal neck.

Monotype.—Female, at the U. S. National Museum.

Specimens examined.—British Columbia: one female, Kokanee Mt., August 11, 1903 [R. P. Currie] 8000 ft. (monotype of *silvana*).

Genus *Cordylomyia* Felt

Cordylomyia Felt, Jour. N. Y. Ent. Soc., 19: 35, 1911; Felt, Bull. N. Y. State Mus., 165: 194, 1913; Kieffer, Gen. Insect., 152: 295, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 199, 1938.

Prosaprionus Kieffer, Marcellia, 12: 54, 1913; Kieffer, Gen. Insect., 152: 300, 1913.

Genotype.—Monobasic and by original designation, (*Cordylomyia coprophila* Felt) = *C. texana* (Felt).

Genotypes of synonyms.—*Prosaprionus:* monobasic, *Prosaprionus cellularis* Kieffer.

The genus *Cordylomyia* differs from *Campylomyza* by having the eye bridge often better developed laterally, the cubital angle more acute; the flagellar segments of the male each with only one complete crenulate whorl, a short incomplete crenulate whorl, and only bristles distally; the male genitalia with the ninth tergum broader, the basiclaspers more broadly united below, the bridge of the basiclasper roots transverse, the tegmen without paired processes dorsally, and the genital rod differently conformed. The female of *Cordylomyia* differs from that of *Campylomyza* by having the flagellar segments each clothed distally with bristles only, the proximal segment with a single sensory pocket, the proximal palpal segment often with a sensory pocket, and with two well developed spermathecae. *Cordylomyia pinetorum* Edwards seems to resemble *Campylomyza* in all respects except in the form of the flagellar sensorial processes, a character in which this species also differs from *Cordylomyia*.

The number of North American species of *Cordylomyia* is probably considerably greater than that treated in this paper. Several of the species have been found only in the late fall or early spring, while others occur throughout the season. *C. texana* has been reared from manure at Washington, D. C.

Key to North American Species (Males)

1. Disticlasper broadly rounded distally; tegmen without long paired processes distally 2
   Disticlasper cupped distally, the inner side concave; tegmen provided distally with two pairs of long lobes ..... **denningi** n. sp.
2. Ninth tergum deeply and triangularly emarginate on caudal margin; tegmen slightly convex distally, with a long acute projection directed laterally at each caudo-lateral angle; each eye completely and widely divided ..... *truncata* (Felt)
   Ninth tergum concave or subtruncate on caudal margin; tegmen without a long angulation on each side caudo-laterally; eye bridge laterally with one or two facets at narrowest 3
3. Tegmen with several strong teeth on each side caudo-laterally, the caudal margin appearing irregular 4
   Tegmen with small denticulations caudo-laterally, the caudal margin evenly convex ..... *sylvestris* (Felt)
4. Tegmen with caudo-lateral angles broadly produced, the teeth directed laterally ..... *texana* (Felt)
   Tegmen with caudo-lateral angles not produced, the teeth directed antero-ventrally ..... *xylophila* Edwards

Key to North American Species (Females)

1. Eye bridge widely devoid of facets on either side; flagellum with eight segments ..... *truncata* (Felt)
   Eye bridge narrowed to one or two facets on either side; flagellum with nine or ten segments 2
2. Palp without sensorial pocket on proximal segment, but with sensory bristles densely scattered over inside of that segment 3
   Palp with well outlined sensorial pocket on proximal segment which contains the sensory bristles 4
3. Flagellum with ten segments; spermathecae rather large, rounded ..... **denningi** n. sp.
   Flagellum with nine segments; spermathecae very small, round. *texana* (Felt)

4. Sensory pocket on first flagellar segment largely open; flagellar segments subcylindrical, each with large sensorial depressions distally; spermathecae round ..... *fulva* Felt

Sensory pocket on first flagellar segment irregularly shaped, with small opening; flagellar segments obconical, without sensorial depressions; spermathecae ovoid .....*sylvestris* (Felt)

Cordylomyia texana (Felt), new combination

Campylomyza texana Felt, Bull. N. Y. State Mus., 124: 316, 1908; Felt, Bull. N. Y. State Mus., 165: 170, 1913.

Cordylomyia coprophila Felt, Jour. N. Y. Ent. Soc., 19: 35, 1911; Felt, Bull. N. Y. State Mus., 165: 197, 1913 (photogr. male genitalia). New synonymy.

Cordylomyia americana Felt, Bull. N. Y. State Mus., 165: 199, 1913. New synonymy.

Cordylomyia coloradensis Felt, Bull. N. Y. State Mus., 165: 199, 1913. New synonymy.

Monardia foliata Felt, Jour. N. Y. Ent. Soc., 24: 195, 1916. New synonymy.

The four type males representing *Campylomyza texana* Felt, *Monardia foliata* Felt, *Cordylomyia coloradensis* Felt, and *C. coprophila* Felt have been studied and found to be identical. The three type females representing *Cordylomyia coprophila* Felt, *C. coloradensis* Felt, *C. americana* Felt are also identical.

Eye bridge rather broad above, but narrowed to a single facet at origin on either side. Palpal segments four. Claws pointed, with strong teeth externally; empodium long and broad. Wings with R_1 slightly over four times length of R_s; cubital fork very acute; Cu_2 evanescent on distal sixth.

Male.—Flagellar segments with distal stem of each segment about same length as proximal portion. Ninth tergum broad, the caudal margin slightly concave; basiclasper rather broadly united below, the roots parallel and connected by a well marked transverse bridge; disticlasper broad, broadly rounded distally; tegmen short and broad, proximally connected with the basiclasper roots by narrow arms, the proximo-lateral tegminal roots pigmented, broad, curving latero-ventrally; distally the tegmen with caudo-lateral angles broadly produced and each bearing three or four strong teeth and several smaller ones caudal to this, the caudal pigmented margin concave but irregularly produced medially and with a hyaline membranous

envelope which may be irregularly convex to a variable extent; genital rod divided below, scarcely divergent distally, capped by a membranous enlargement on either side of the distal end of the rod.

Female.—Antenna with two plus nine segments, the ninth flagellar segment constricted beyond middle; proximal flagellar segment with a moderately small but deep sensory pocket having the opening only slightly constricted; following eight flagellar segments each markedly longer than wide and with a small distal neck, each provided with a proximal whorl of long bristles, a few shorter bristles beyond this, and rather long sensory bristles distally and beyond the middle on one side. Palp with proximal segment considerably enlarged, with almost the entire inner face densely set with sensory bristles but not set in a well outlined pocket. Anterior tarsus with distal two segments of about same length and breadth. Spermathecae two, very small, round, heavily pigmented.

The Alabama female differs somewhat in that R_1 is about five times the length of R_s on one wing and about six times this length on the other wing.

Monotype.—Male, at the New York State Museum.

Types of synonyms.—*Coprophila:* lectotype male, by present designation, at the U. S. National Museum; *americana:* monotype female, at the New York State Museum; *coloradensis:* lectotype, male, by present designation, at the New York State Museum; *foliata:* monotype male, at the New York State Museum.

Specimens examined.—Alabama: one female, Florence, J. M. Robinson. Colorado: one male, one female, Boulder [October, 1910] T. D. A. Cockerell, on window (lectotype and paralectotype of *coloradensis*); one male, Boulder, March 20, 1916, T. D. A. Cockerell (monotype of *foliata*); one male, one female, Boulder, October 21, 1916 (determined by Felt as *coloradensis*); one female, Boulder, October 15, T. D. A. Cockerell (monotype of *americana*); one male, Boulder, October 22 [T. D. A. Cockerell] (recorded as *texana* by Felt); 1 male (on cardpoint), October 22, Cockerell (U. S. National Museum); one male, Boulder, T. D. A. Cockerell (determined by Felt as *texana*); two males, Boulder, T. D. A. Cockerell, at window (undetermined by Felt). District of Columbia: one male, one female (also one pupal exuvium), Washington (lectotype and paralectotype of *coprophila*). Texas: one male, Plano, November, 1907, E. S. Tucker (monotype of *texana*).

Cordylomyia xylophila Edwards

Cordylomyia xylophila Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B) : 200, 1938 (fig. palp. female antenna, and male genitalia).

Cordylomyia xylophila is closely related to *texana* from which it differs in having the caudo-lateral angles of the tegmen unproduced and the teeth on these angles directed ventrally and somewhat anteriorly. The female which Edwards ascribed to *xylophila* differs considerably from that of *texana* in that the flagellar segments of the former are proportionally shorter with the distal sensory spines on each flagellar segment much shorter. Sensory pockets of the female palp or antenna were not mentioned by Edwards.

Type.—Probably male, at the British Museum (Natural History).

Specimens examined.—MINNESOTA : one male, Campbell, October 15, 1941, D. G. Denning.

Cordylomyia fulva Felt

Cordylomyia fulva Felt, Canad. Ent., 58 : 266, 1926.

Cordylomyia praelonga Felt, Canad. Ent., 58 : 266, 1926. New synonymy.

Cordylomyia scutellata Felt, Canad. Ent., 58 : 267, 1926. New synonymy.

Felt gave no reasons for considering *C. fulva, praelonga,* and *scutellata* as distinct species. The writer is unable to distinguish between the three type females, and they are all from the same locality. *C. fulva* was described as having twelve antennal segments, but the monotype female of this species has only eleven segments as in the other females.

The male is represented only by one specimen, and this is in poor condition. The genitalia of this specimen are distorted, partial side view, but seem to be very similar to *texana.* The tegmen appears to have the caudo-lateral angles each broadly produced laterally, forming a bifid angulation provided with several strong teeth. The ninth tergum, disticlasper, and genital rod appear similar to *texana.*

Palpal segments four, the fourth segment long. Wings with costal cell broad; R_1 very long, about six times the length of R_s; cubital fork very acute; Cu_2 tapering, evanescent on distal fifth.

Male.—Eye bridge narrowed to two facets at origin on either side. Flagellar segments with stems decidedly longer than the enlargements, the bristles of the complete crenulate whorl very long.

Female.—Eye bridge narrowed to one facet at origin on either side. Antenna with two plus nine segments, the ninth flagellar segment compound, with a constriction beyond the middle; proximal flagellar segment with a moderately large sensory pocket which is largely open; flagellar segments a little longer than broad, the distal segments somewhat longer, the distal neck short, each segment clothed with a proximal whorl of long bristles, shorter bristles scattered medially, and blunt bristles distally which are largely concentrated in a depression on either side. Palp with proximal segment somewhat enlarged, inside with a round pocket of sensory bristles which does not extend past middle of the segment. Anterior tarsus with distal segment a little longer than preceding segment, of same breadth. Spermathecae two, heavily pigmented, rounded, moderately small.

Monotype.—Female, at the New York State Museum.

Types of synonyms.—*Praelonga:* lectotype female, by present designation, at the New York State Museum; *scutellata:* monotype female, at the New York State Museum.

Specimens examined.—Minnesota: one female, Plummer, November 20, 1933, D. G. Denning, collected off snow. British Columbia: one female, Cranbrook, May 19, 1920, C. Garrett (monotype of *fulva*); one male, one female, Cranbrook, October 14, 1922, C. Garrett (lectotype and paralectotype of *praelonga*); one female, Cranbrook, October 23, 1921, C. Garrett (monotype of *scutellata*).

Cordylomyia sylvestris (Felt)

Campylomyza sylvestris Felt, Bull. N. Y. State Mus., 110: 97, 1907; Felt, Bull. N. Y. State Mus., 124: 313, 1908.

Cordylomyia sylvestris (Felt): Felt, Bull. N. Y. State Mus., 165: 195, 1913.

Cordylomyia sylvestris is a common species in Minnesota. Previously this species has been known only from a single female from North Carolina. The female may be recognized by the characteristic sensory pocket on the proximal flagellar segment, and the male may be recognized by the characteristic tegmen. *C. sylvestris* is closely related to the European *C. rudis* (Winnertz), but the male genitalia (Plate I, fig. 5) differ from Edwards' figure of that species in having the caudal margin of the ninth tergum more deeply emarginate and the caudal margin of the tegmen more broadly convex.

Eye bridge rather narrow, one facet wide on lower lateral

portion. Palp four segmented, the fourth about one and one-half times as long as the preceding. Claws pointed, each with three strong teeth externally; empodium long and broad. Costal cell rather broad; R_1 four to five times (fully five times in the monotype female) as long as R_s; cubital fork broad; Cu_2 evanescent on distal fourth.

Male.—Flagellum with segmental stems about as long as the enlargements, shorter on proximal and distal segments. Ninth tergum rather broad, the posterior margin deeply and roundly emarginate; basiclasper roots nearly parallel, the bridge transverse and medially narrowed; disticlasper broadly rounded; tegmen broad, each proximo-lateral angle with a curved dorsal arm from the basiclasper root and with a rather narrow root directed latero-ventrally, each caudo-lateral angle a little produced and provided with small denticulations, the caudal margin broadly and evenly convex; genital rod parallel sided distally, with a hyaline cap into which leads a large pigmented duct on either side of the tip of the rod.

Female.—Antenna with two plus nine segments, the ninth flagellar segment long, compound, constricted beyond the middle; first flagellar segment enlarged, with a large, irregular, sensory pocket having a small external opening; following seven segments each a little longer than broad, tapering somewhat distally, and with a slight neck; each segment with a proximal whorl of long bristles, a median, incomplete, and irregular whorl of shorter bristles, and moderately dense sensory bristles occupying middle half of length of the segment inside. Spermathecae ovoid (collapsed somewhat in the monotype), moderately large.

Monotype.—Female, at the New York State Museum.

Specimens examined.—Minnesota: one male, one female, Afton, May 10, 1941, A. E. Pritchard; one male, one female, Afton, September 6, 1941, A. E. Pritchard; one male, Aitkin, July 9, 1941, A. E. Pritchard; one male, Avon, June 24, 1941, A. E. Pritchard; one female, Bacchus, July 8, 1941, A. E. Pritchard; five males, Detroit Lakes, June 20, 1941, A. E. Pritchard; one male, one female, Grand Rapids, August 1, 1941, A. E. Pritchard; two males, Nisswa, July 8, 1941, A. E. Pritchard; two males, Pigeon River, August 3, 1941, A. E. Pritchard; six males, one female, Pine City, May 3 and August 4, 1941, A. E. Pritchard; one female, St. Paul, May 12, 1941, A. E. Pritchard and H. Knutson; four males, one female, Tenstrike, July 31, 1941, A. E. Pritchard. North Carolina: one female, David-

son's River, September 23, 1906, window of a woodland hut (monotype of *sylvestris*). North Dakota: one female, Fargo, June 21, 1941, A. E. Pritchard.

Cordylomyia truncata (Felt), new combination

Campylomyza truncata Felt, Jour. N. Y. Ent. Soc., 20: 102, 1912; Felt, Bull. N. Y. State Mus., 165: 170, 1913.

Cordylomyia truncata is characterized by having the mediodorsal portion of the eyes completely and widely separated from the lateral portions and by the form of the male genitalia. The female has been previously unknown, but the Felt collection contains one female from the same locality as the monotype male, the eye structure of which indicates that it is conspecific. This female is labelled "?wingless," but the remaining portions of the wings are evident.

Eye bridges devoid of facets laterally, the remaining portions of the eyes widely separated. Palp four segmented. Costal cell moderately broad; R_1 four times as long as R_s; cubital fork rather broad; Cu_2 evanescent on distal fourth.

Male.—Flagellum with stems about equal to the enlargements or slightly longer on distal segments. Ninth tergum broad, the caudal margin broadly and acutely triangular emarginate; tenth tergites small, situated beneath the ninth tergum; basiclasper roots convergent below; the bridge rather narrow and straight; disticlasper broadly rounded distally; tegmen evenly convex distally, the caudolateral angles extended into a laterally projecting spine on either side; proximally the tegmen heavily sclerotized on either side and with a curved arm on either side above which extends from the basiclasper root; genital rod appearing bifid for its entire length (ventral view), with the distal ends divergent, and with a membranous enlargement distally which is acutely pointed and with a number of spinose projections distally.

Female.—Antenna with two plus eight segments, the eighth flagellar segment compound, constricted beyond the middle and with the distal portion smaller and obconical; proximal flagellar segment with a small, completely open sensorial cup; flagellar segments each longer than broad (mostly shrivelled), with a slight distal neck, with a proximal whorl of long bristles, shorter bristles medially, and with dense sensory bristles distally. Characters of proximal palpal segment obscured in the mount. Spermathecae absent, probably lost in KOH treatment.

Monotype.—Male, at the N. Y. State Museum.

Specimens examined.—PENNSYLVANIA : one male, Hazelton, April 17 (not 19), 1910, Dietz (monotype of *truncata*) ; one female, Hazelton, May 12, 1910, Dietz (undetermined by Felt).

Cordylomyia denningi n. sp.

Cordylomyia denningi differs considerably from all other members in the genus by having two pairs of long lobes caudally directed from the distal end of the tegmen of the male genitalia (Plate I, fig. 7). These lobes are slightly irregular and appear to have dorsal teeth. The male disticlasper differs from North American species and resembles the European *bifida* Edwards in having the inner side strongly concave and the inside margin below irregularly widened distally.

A dark brown species, containing reddish pigment in life. Eye bridge broad above antennae, but narrowed to one facet at origin on either side. Palpal segments four. Claws acute, each with several teeth externally; empodium as long as claws, very broad. Wings pale brownish, covered with long, fine macrotrichia; costal cell rather wide; R_1 about five times the length of R_s; cubital fork acute, the branches long; Cu_2 evanescent on distal sixth. Length of wing, 1.9 mm.

Male.—Antenna with two plus twelve segments, the stems of the flagellar segments slightly longer than the enlargements on proximal segments, decidedly longer beyond this; the penultimate segment with a stem as long as the enlargement; flagellar segments each with a median crenulate whorl of very long bristles, beyond this with an incomplete crenulate whorl, groups of short sensory bristles, and long bristles. Ninth tergum largely membranous, very broad, the caudal margin shallowly concave; tenth tergites a pair of deep lobes beyond the ninth tergum; basiclaspers very broadly united below, the roots very long, subparallel, connected by a very broad, transverse bridge; disticlasper broadly and evenly curved externally, irregularly widened distally and below on the inside, strongly and evenly concave on the inside above this; tegmen heavily pigmented on either side, strongly widened proximally, the caudo-lateral angles with a very broad ventral root and with a dorsal arm curving from the basiclasper root, distally with the lateral margins approximated above and produced to form a pair of long caudally directed lobes, and the lateral margins below divergent and produced to form another pair of long caudally

directed lobes; genital rod somewhat widened distally and emarginate at distal end.

Female.—Antenna with two plus ten segments, the terminal segment constricted near distal end; proximal flagellar segment with a moderately large, completely open sensory cup; flagellar segments considerably longer than broad, attenuating somewhat toward the rather short distal stem, clothed with spines which distally are dense, sensory, and rather long. Palp with first segment enlarged, with sensory bristles scattered on the dorsal surface, densely so on proximal half; distal three segments successively increasing in length. Spermathecae rather large, heavily pigmented, rounded, and each with a small neck directed inwardly.

Holotype.—Male, Fridley, Anoka Co., Minnesota, April 3, 1942, D. G. Denning; at the University of Minnesota.

Paratypes.—One male, four females, Fridley, Minnesota, April 3, 1942, A. E. Pritchard and D. G. Denning.

The type series was collected in a wooded ravine near the Mississippi River, very early in the spring. This species is named in honor of Dr. D. G. Denning who collected specimens of this species and other material included in this revision.

Genus *Corinthomyia* Felt

Corinthomyia Felt, Jour. N. Y. Ent. Soc., 19: 35, 1911; Felt, Bull. N. Y. State Mus., 165: 200, 1913; Kieffer, Gen. Insect., 152: 295, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 203, 1938.

Genotype.—Monobasic and by original designation (*Campylomyza hirsuta* Felt) = *Corinthomyia brevicornis* (Felt).

The genus *Corinthomyia* is closely related to *Cordylomyia*. The male flagellar segments of *Corinthomyia*, however, have a series of crenulate whorls of rather short, curved bristles. The female of *Corinthomyia* differs from that of *Cordylomyia* in having the flagellar segments each broader than long, the spermathecae two in number, one large and lightly pigmented, the other very small and darkly pigmented, and the cubital angle is very broad.

Only one species of *Corinthomyia* is known, and it is widely distributed in North America. Edwards has described and figured the same species from Europe as *?cincinna*. The writer has seen one female from Angol, Chile, May 31, 1934, D. S. Bullock, which appears to be identical with North American females.

Corinthomyia brevicornis (Felt), new combination

Campylomyza brevicornis Felt, Bull. N. Y. State Mus., 110: 97, 1907; Felt, Bull. N. Y. State Mus., 124: 314, 1908.

Cordylomyia brevicornis (Felt): Felt, Bull. N. Y. State Mus., 165: 196, 1913 (fig. female antennal segments and palp).

Campylomyza luna Felt, Bull. N. Y. State Mus., 124: 313, 1908. New synonymy.

Cordylomyia luna (Felt): Felt, Bull. N. Y. State Mus., 165: 196, 1913.

Campylomyza hirsuta Felt, Bull. N. Y. State Mus., 124: 315, 1908. New synonymy.

Corinthomyia hirsuta (Felt): Felt, Jour. N. Y. Ent. Soc., 19: 35, 1911; Felt, Bull. N. Y. State Mus., 165: 201, 1913.

Campylomyza currei Felt, Bull. N. Y. State Mus., 124: 315, 1908. New synonymy.

Corinthomyia currei (Felt): Felt, Bull. N. Y. State Mus., 165: 202, 1913 (photogr. male genitalia).

Campylomyza bryanti Felt, Bull. N. Y. State Mus., 124: 313, 1908 (photogr. wing). New synonymy.

Cordylomyia bryanti (Felt): Felt, Bull. N. Y. State Mus., 165: 195, 1913.

Corinthomyia gracilis Felt, Jour. N. Y. Ent. Soc., 20: 102, 1912; Felt, Bull. N. Y. State Mus., 165: 201, 1913. New synonymy.

Cordylomyia tumida Felt, Bull. N. Y. State Mus., 165: 197, 1913. New synonymy.

Corinthomyia cincinna Felt, Bull. N. Y. State Mus., 165: 200, 1913 (*lapsus calami* as *gracilis,* p. 201) (fig. male antennal segments). New synonymy.

Corinthomyia ?cincinna Felt: Edwards, Proc. Roy. Ent. Soc., Lond., 7 (ser. B): 203, 1938 (fig. male wing, palp, antenna, genitalia, and female wing, antenna). New synonymy.

The four monotype males representing *currei, hirsuta, cincinna,* and *gracilis* were differentiated by Felt largely on a basis of the number of crenulate whorls of bristles on the flagellar segments. These four males all agree in having each flagellar segment provided with four complete crenulate whorls, followed by three incomplete crenulate whorls which successively shorten in length, the last being very short and somewhat irregular. If this is not taken into consideration, the number of crenulate whorls counted will depend on the angle at which one face of the antenna is viewed. The male

genitalia of these four types are identical except for the shape of the tegmen. In the *hirsuta* male, the tegmen is smoothly and evenly triangular with a broad base; in the other males, the edges of the tegmen are crumpled, and in correlation with this distortion, the base is of varying width. The tegmen is weakly sclerotized, and with treatment in KOH and mounting, the outline of the tegmen could easily become wrinkled and cause this apparent variation.

The writer is unable to differentiate between the females representing *brevicornis, bryanti, luna* and *tumida.* There is no difference in the length of R_1 (subcosta of Felt) in proportion to the length of the wing as Felt's key indicates. The fourth palpal segment of *tumida* was characterized as being swollen distally; this segment in the monotype, however, is shrivelled on one palp and flattened on the other. There are no significant differences in the antennae of these type females.

Male genitalia.—Ninth tergum rather broad, with a median portion non-pigmented and without setae, the anterior margin darkened except medially, and forming a broadly angulate emargination, the posterior margin rather rounded. Tenth tergites a pair of setulose lobes below the ninth. Basiclasper rather broadly united below the ninth. Basiclasper rather broadly united below, the roots long, somewhat convergent, with a transverse bridge which is concave on anterior margin. Disticlasper broad, broadly rounded distally, with many heavy bristles inside and distally. Tegmen shield-shaped, proximally with a pair of arms above each of which curves posteriorly from the basiclasper root, the proximo-lateral angles extending ventrally. Genital rod narrowly divided beyond base, with an elliptical, membranous enlargement distally which is somewhat pubescent and proximally connected with a pair of long tubes which enter on either side of the genital rod.

Monotype.—Female, at the U. S. National Museum.

Types of synonyms.—*Luna:* monotype female, at the New York State Museum; *hirsuta:* monotype male, at the New York State Museum; *currei:* monotype male, at the U. S. National Museum; *bryanti:* monotype female at the New York State Museum; *gracilis:* monotype male, at the New York State Museum; *tumida:* monotype female, at the New York State Museum; *cincinna:* monotype male, at the New York State Museum.

Specimens examined.—District of Columbia: one female, Washington, May 10, 1935, Alan Stone, on window. Florida: one female, Jacksonville (recorded by Felt as *brevicornis;* retained in

Felt collection and not in U. S. National Museum). Minnesota: one female, Crookston, July 2, 1938, A. E. Pritchard; twenty-seven females, Hovland, August 3, 1941, A. E. Pritchard, flying at dusk along Lake Superior; one male, seven females, Itasca Park, June 10, 1937, H. R. Dodge. New York: one female, Albany, August 1, 1906 (monotype of *hirsuta*); one female, Albany, June 25, 1907 (monotype of *tumida*); one male, Albany, July 5, 1907 (monotype of *cincinna:* labelled "*concinna*"); one female, Albany, July 16, 1907 (determined by Felt as *brevicornis*); one female, Nassau, July 31, 1906 (recorded by Felt as *brevicornis*); one female, Nassau, August 10, 1906 (monotype of *brevicornis*); one female, Westfield, July 11, 1906 (monotype of *luna*). Pennsylvania: four females (all on cardpoints), Hazelton, April 11, 12, and May 12, 20, 1910, Dietz (determined by Felt as *?tumida*); four males (one on cardpoint), Hazelton, May 9, 10, and 11, 1910, Dietz (determined by Felt as *?gracilis*); one male, Hazelton, May 18, 1910, Dietz (monotype of *gracilis*). British Columbia: one female (on cardpoint), Kaslo, June 22, R. P. Currie (determined by Felt as *currei*); one female (on cardpoint), Kaslo, June 23, R. P. Currie (in the U. S. National Museum); one male, Kaslo, July 6, Dyar (monotype of *currei*); one female, Kaslo, July 6, H. G. Dyar (recorded by Felt as *brevicornis*). Newfoundland: one female, Little River, August 18, 1905, Owen Bryant (monotype of *bryanti*).

Genus *Xylopriona* Kieffer

Xylopriona Kieffer, Gen. Insect., 152: 291, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B); 204, 1938; Mani, Ind. Jour. Ent., 7: 193, 1946.

Tetraxyphus Kieffer, Gen. Insect., 152: 290, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 204, 1938.

Genotype.—By original designation *Campylomyza pulchricornis* Kieffer.

Genotype of synonyms.—*Tetraxyphus:* monobasic, *Campylomyza melanoptera* Kieffer.

The genus *Xylopriona* is here recognized for a heterogeneous group of species all of which agree in having R_1 short, the empodium as long as the claws, twelve flagellar segments in the male, and two spermathecae in the female. The male genitalia of these species are rather similar and are of the *Monardia* type, except that the terminal spine or spur on the disticlasper is more strongly developed. The females, however, differ considerably in the number of flagellar segments and in the form of the sensorial processes on the flagel-

lum. *Xylopriona,* based on the present concept, differs from *Monardia* essentially in having the empodium present, as long as the claws. The tarsal scales are present, being long and narrow.

Tetraxyphus must be considered a synonym of *Xylopriona.* Edwards pointed out that the two genera might well be united and showed that there is no clear distinction between them in the male sex. *Xylopriona* was differentiated from *Tetraxyphus* by Kieffer on a basis of the structure of the female antenna. The sensorial processes of the female flagellum of *Xylopriona* are typically broad, each arising from a row of pores; these processes in *Tetraxyphus* are typically long and pointed, each arising from one large pore. Edwards showed, however, that intermediate forms occur. A generic distinction between *Xylopriona* and *Tetraxyphus* thus seems to be unwarranted, and Mani has selected the former name in preference.

Monardia articulosa (Felt) and *Monardia toxicodendri* (Felt) are here referred to the genus *Xylopriona.* The sensorial processes of the flagellum of the female in these two species are as in *Monardia,* in the form of discs and each arising from a single large pore. *X. crebra* has no well developed sensory processes on the flagellar segments of the female, but has many sensory spines as in *Cordylomyia. Campylomyza antennata* Winnertz was included in *Xylopriona* by Kieffer, because of a similarity in the sensory processes of the female flagellum. Edwards transferred *antennata* to *Monardia,* attaching a greater significance to the lack of empodia in that species.

One species, *X. toxicodendri,* was reared from cow manure, in Illinois.

Key to North American Species

1. Palpus three segmented, the third segment but little longer than the second; male disticlasper short, with a very long distal spur; female flagellum with nine to eleven segments, each with four sensorial processes in the form of discs.
   toxicodendri (Felt)

   Palpus four segmented or, if three segmented, the third segment very long 2
2. Female with twenty-two flagellar segments, each with four disc-like sensorial processes; proximal flagellar segment of female without sensorial pockets; male unknown.
   articulosa (Felt)

   Female with eight flagellar segments, each with densely set sensorial bristles distally; proximal flagellar segment of

female with pair of large sensorial pockets; male disticlasper with a stout, curved spine distally ..... **crebra** n. sp.

Xylopriona toxicodendri (Felt), new combination

Campylomyza toxicodendri Felt, Bull. N. Y. State Mus., 110: 98, 1907; Felt, Bull. N. Y. State Mus. 124: 314, 1908.

Monardia toxicodendron (misspelling for *toxicodendri*) (Felt): Felt, Bull. N. Y. State Mus., 165: 186, 1913 (fig. female antennal segments, palp, and ovipositor).

Campylomyza gilletti Felt, Bull. N. Y. State Mus., 124: 314, 1908. New synonymy.

Monardia gilletti (Felt): Felt, Bull. N. Y. State Mus., 165: 185, 1913.

Monardia alexanderi Felt, Bull. N. Y. State Mus., 165: 187, 1913. New synonymy.

Monardia modesta Felt, Psyche, 20: 142, 1913. New synonymy.

Monardia illinoiensis Felt, Jour. N. Y. Ent. Soc., 43: 47, 1935. New synonymy.

Monardia nigricans Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 242, 1938. (fig. male genitalia, wing, female antenna, spermathecae). New synonymy.

X. toxicodendri is probably a rather widely distributed species both in North America and Europe.

The male of *toxicodendri* may be easily recognized by the very long, stout, distal spur on the short disticlasper. The empodium is rather narrow and is as long as the claws. Edwards adequately described and figured the male sex from England. The stems of the flagellar segments of the male appear to vary somewhat, particularly on the penultimate segment.

The female of *toxicodendri* typically has nine flagellar segments, the last segment being constricted. This number, however, is subject to variation, and cannot be considered specific. The flagellum of the monotype female of *gilletti* has nine segments, the terminal segment simple; of the type females of *alexanderi* and *illinoiensis*, nine segments with the terminal segment constricted; of the monotype of *toxicodendri*, nine-segmented with the terminal segment compound; of *modesta*, ten-segmented with the tenth segment compound. There are no other apparent differences in these females. Each flagellar segment bears four disc-shaped sensoria each arising from a single pore, similar to that found in *Monardia*. The palpus is three-segmented (not four-segmented in *illinoiensis* as originally described), with the third segment but a little longer than the second. The spermathecae are two in number and are moderately

large, rounded and flattened, and darkened peripherally as in the single spermatheca of *Campylomyza*.

Monotype.—Female, at the New York State Museum.

Types of synonyms.—*Gilletti:* monotype female, at the New York State Museum; *alexanderi:* monotype female, at the New York State Museum; *modesta:* monotype female, at the New York State Museum; *illinoiensis:* two males (on one slide), cotypes, at the U. S. National Museum (other cotypes are at the Illinois State Natural History Survey); *nigricans:* type male, at the British Museum (Natural History).

Specimens examined.—CONNECTICUT: one female, New Haven, November 4, 1903, H. L. Viereck (monotype of *modesta*). ILLINOIS: two males, three females, Urbana, February 25, 1932, Carl Mohr [reared from cow dung] (cotypes of *illinoiensis*). MINNESOTA: one female, Avon, June 24, 1931, A. E. Pritchard; one male, Bayport, May 10, 1941, A. E. Pritchard; one male, Hallock, May 23, 1938, A. E. Pritchard; two females, St. Paul, May 4, 1941, A. E. Pritchard; one female, Stillwater, September 27, 1941, A. E. Pritchard; two males, Wadena, July 3, 1941, A. E. Pritchard. NEW YORK: one female, Albany, June 4, 1906 (monotype of *toxicodendri*): one female, Sport Island, Sacandaga River, July 25, 1909, C. P. Alexander (monotype of *alexanderi*). PENNSYLVANIA: one female, Highspire (not Albany, N. Y.), September 11, 1907 (monotype of *gilletti*). WISCONSIN: one female, Hudson, September 1, 1941, A. E. Pritchard.

Xylopriona articulosa (Felt), new combination

Campylomyza articulosa Felt, Bull. N. Y. State Mus., 124: 315, 1908.

Monardia articulosa (Felt): Felt, Bull. N. Y. State Mus., 165: 192, 1913.

This species is known only from a single female specimen. The flagellum is very long, twenty-two segmented, and shaped as in *X. querceti* Edwards, the segments each being broader than long and with a short distal neck. There are four sensorial processes on each segment as in *Monardia*, the processes being disc-like and each arising from a single pore. There are four palpal segments. The empodium is as long as the claws, but very narrow. There are two rounded spermathecae.

Monotype.—Female, at the U. S. National Museum.

Specimens examined.—NEW HAMPSHIRE: one female, White Mountains, Morrison (monotype of *articulosa*).

(*To be continued*)

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THE NORTH AMERICAN GALL MIDGES OF THE TRIBE MICROMYINI: ITONIDIDAE (CECIDOMYIIDAE); DIPTERA

BY A. EARL PRITCHARD
UNIVERSITY OF CALIFORNIA, BERKELEY, CALIFORNIA

(*Continued from vol. XXVII, no. 1, p. 44*)

Genus *Xylopriona* Kieffer (*continued*)

Xylopriona crebra n. sp.

Crebra conforms with the genus *Xylopriona* in having R_1 short, the eye bridge not constricted laterally, and the empodium long and rather narrow. The male genitalia are very similar to the genitalia of typical *Xylopriona*. The ovipositor is very similar to that of typical *Xylopriona*, and the two spermathecae are also similar. The flagellum of the female, however, differs markedly from *Xylopriona* in lacking plate-like sensorial processes. The flagellar segments of the female are each provided distally with dense sensorial bristles as in *Cordylomyia;* and the first flagellar segment bears a pair of sensorial depressions as in *Campylomyza*, but these are larger and more distinct than in that genus. The very acute cubital angle of *crebra* is distinctive.

X. crebra is the only known species of the MICROMYINI in which R_s may not be present. In the series of specimens at hand, R_s may be distinct, partially obsolete, or entirely absent. A sensory pore is present on r–m immediately before the position of R_s.

A rather dark brownish species, the legs except for ultimate tarsal segments somewhat lighter. Eye bridge three or four facets wide laterally, three facets wide medio-dorsally. Palp three-segmented, the third segment twice as long as the second and sometimes subdivided; without scales. Tarsi clothed with long and shorter bristles and a few long, narrow scales; claw rather evenly curved, acute distally, with several fine teeth externally; empodium as long as claws, rather narrow. Wings long and narrow, light brownish; R_1 less than twice the length of R_s; R_s rather oblique, partially or entirely evanescent; cubital angle very acute; Cu_2 evanescent on distal half; anal angle broadly obtuse. Wing length, 1.5 mm.

Male.—Antenna with two plus twelve segments, the terminal segment smaller, obconical; segmental stems of flagellum excentric, slightly less than twice length of larger portions, somewhat shorter on proximal segments and of about same length as larger portion on penultimate segment; larger portions of segments each with a whorl of short bristles proximally, a complete crenulate whorl of long bristles medially, an incomplete crenulate whorl of long bristles pre-distally, and several long bristles on one side distally. Palp with third segment very long, constricted medially. Hypopygium (Plate 2, fig. 13) with ninth tergum moderately broad, the anterior and posterior margins parallel; tenth tergites a pair of lobes beyond the ninth tergum; basiclaspers moderately united below, the basiclasper roots somewhat convergent and united distally by a long transverse bridge; disticlasper plump, with a heavy spine distally which is directed inwards; tegmen shield-shaped, with a dorsal arm on each caudo-lateral angle; genital rod long, emarginate at distal end.

Female.—Antenna with two plus eight segments, the distal segment with a terminal nipple; proximal segment of flagellum with a pair of large, dark brown, somewhat irregular sensory pockets; flagellar segments distinctly longer than broad, obconical, each with a slight distal neck, clothed with a sparse median whorl of bristles and other bristles beyond this, distally with dense, moderately long sensory bristles. Third palpal segment not constricted. Ovipositor long, with segments seven to nine protrusible; ninth segment deeply excavated dorsally for insertion of the lamellae. Spermathecae two, darkly pigmented, small, round.

Holotype.—Male, Afton, Minnesota, May 18, 1941, A. E. Pritchard, at the University of Minnesota.

Paratypes.—Two males, Afton, Minnesota, May 18, 1941, A. E. Pritchard and H. Knutson; one female, Anoka, Minnesota, June 15, 1941, A. E. Pritchard; one female, Swan Lake, Minnesota, August 6, 1941, A. E. Pritchard; one female, Vineland, Minnesota, May 24, 1941, A. E. Pritchard.

Polyardis n. gen.

Genotype.—*Campylomyza carpini* Felt.

The genus *Polyardis* is here proposed for a group of closely related species which are rather intermediate between *Monardia* and *Xylopriona,* but differing from both of these genera in having only one spermatheca in the female. *Polyardis* further differs from *Monardia* in having the empodium rather narrow, as long as the claws, and from *Xylopriona* in having the tarsal scales long but rather broad. The male genitalia are of the usual *Monardia* type.

The flagellum of the female of *Polyardis* typically is densely set with sensory spines. A few of these sensory spines on each segment are differentiated into narrow, awl-shaped processes in one species, and in another species there are four modified disc-like processes on each segment. The number of flagellar segments in the female is somewhat variable.

Eye bridge two to three facets wide laterally and two to four facets wide dorsally. Flagellum of male eleven- to thirteen-segmented, each segment with one complete and one incomplete crenulate whorl, and distally with bristles or small plate-like processes; flagellum of female nine- to eleven-segmented, each segment with sensory bristles distally, awl-shaped sensory processes, or four disc-like processes each bearing a curved and pointed projection directed to one side. Palpus three- or four-segmented. Mesonotal clothing sparse, mostly dorso-central and lateral. Tarsal scales dense, long, and moderately broad; claws scarcely enlarged predistally, each with several fine teeth medio-externally; empodium rather narrow, as long as the claws. Wings moderately clothed with macrotrichia; costa nearly reaching media; R_1 about as long as or twice as long as R_s; sensory pore present on r–m, not on R_5; cubitus with posterior branch rather curved. Hypopygium with ninth tergum narrow; basiclaspers moderately united below; basiclasper roots convergent and rather roundly united distally; disticlasper with a small spine distally; tegmen shield-shaped, broadly united

caudo-laterally with ventral arms of the basiclasper roots; genital rod long, not obviously modified distally. Spermatheca one, rather large, flattened and rounded.

With the exception of *monotheca,* the species are very similar, but differ somewhat in the male sex in the number of antennal segments, in the lengths of the flagellar stems, and in the shape of the tegmen. These characters appear to be constant for a species. Representatives of *Polyardis* occur in both North America and Europe. None of the species has been reared.

KEY TO NORTH AMERICAN SPECIES (MALES)

1. Palpus three-segmented; flagellar segments with bristles only ... 2
   Palpus four-segmented; proximal flagellar segments with small, disc-like sensorial processes ..... *monotheca* (Edwards)
2. Flagellum eleven-segmented; tegmen with sides nearly parallel on proximal half, convergent on distal half, and with apex acute ..... *vitinea* (Felt)
   Flagellum twelve- or thirteen-segmented 3
3. Flagellum twelve-segmented; tegmen elongate, attenuated from base to a narrow apex ..... **adela** n. sp.
   Flagellum thirteen-segmented; tegmen rather broad 4
4. Tegmen broadly rounded distally, the apex abruptly hyaline. **aporia** n. sp.
   Tegmen with sides convergent distally, forming a pigmented angle at apex ..... *carpini* (Felt)

Polyardis vitinea (Felt), new combination

Campylomyza vitinea Felt, Bull. N. Y. State Mus., 110: 98, 1907; Felt, Bull. N. Y. State Mus., 124: 314, 1908; Felt, Bull. N. Y. State Mus., 165: 166, 1913 (fig. male antennal segments).

Polyardis vitinea is known only from a single male specimen taken in New York. The male of this species may be recognized by having only eleven flagellar segments. The stem of the flagellar segments of the monotype are shorter than the enlargements, the penultimate segment is without a stem, and the terminal segment is about the same size as the preceding segment. The tegmen is moderately broad, essentially parallel sided on the proximal two-thirds and acutely tapering on the distal third; the distal margin is entirely sclerotized.

Monotype.—Male, at the New York State Museum.

Specimens examined.—NEW YORK: one male, Albany, August 15 (not 14), 1906 (monotype of *vitinea*).

Polyardis adela n. sp.

Polyardis adela is closely related to *vitinea* (Felt), but differs by having twelve segments in the male flagellum and the stems of the middle flagellar segments longer than the enlargements. The male genitalia are of the usual *Monardia* type, but the tegmen is distinctive, being long and slender, attenuated from the base, and with the narrow distal end hyaline (Plate II, fig. 10).

The female has not been definitely identified. One female was taken in association with an *adela* male at Fosston, Minnesota, which is distinctive because a few of the sensorial bristles on each flagellar segment are enlarged and awl-shaped, rather sinuate, and rarely forked. The flagellum of this female has ten obconical segments with the tenth segment compound, and the spermatheca is very large as in *carpini*.

A yellowish-brown species, with darker thorax. Eye bridge about three facets wide laterally, four facets wide mediodorsally. Palpi three-segmented; first segment with sensory bristles above; second and third segments about equal in length. Mesonotum with dorso-central and lateral bristles. Tarsi clothed with longer and shorter bristles and densely clothed with long, rather wide scales; claws evenly curved, acute distally, and with fine teeth externally; empodium as long as claws, moderately narrow. Wings light brownish; R_1 slightly longer than R_s; cubital fork rather acute angled, the branches pale; Cu_2 curved, evanescent distally. Length of wing, 1.1 mm.

Male.—Antenna with two plus twelve segments; stems of the middle flagellar segments distinctly longer than the enlargements, shorter on proximal segments; penultimate segment with stem one-half length of enlargement (considerably variable); enlargements of flagellum with proximal whorl of bristles, a median crenulate whorl of bristles which are more closely set dorsally, a short portion of a crenulate whorl dorsally beyond this, and with distal bristles. Hypopygium with ninth tergum very narrow; tenth tergites a pair of lobes beyond the ninth tergum; basiclasper rather broadly united below, the basiclasper roots convergent and united by a short, transverse bridge; disticlasper rather short, attenuated somewhat, distally with a short, inwardly directed spine and several short, nodulate bristles; tegmen elongate, tapering from the base, and with the narrow apex hyaline; genital rod unmodified distally.

Holotype.—Male, Afton, May 10, 1941, A. E. Pritchard, at the University of Minnesota.

Paratypes.—Seven males, Afton, Minnesota, May 10, 1941, A. E. Pritchard; two males, Anoka, Minnesota, June 15 and August 30, 1941, A. E. Pritchard; one male, Duluth, Minnesota, August 2, 1941, A. E. Pritchard; one male, Fosston, Minnesota, July 30, 1941, A. E. Pritchard; two males, Hawley, Minnesota, July 25, 1941, A. E. Pritchard; one male, Houston Co., Minnesota, May 30, 1941, A. E. Pritchard; one male, Park Rapids, Minnesota, July 4, 1941, A. E. Pritchard; one male, St. Paul, Minnesota, July 19, 1941, A. E. Pritchard; one male, Zumbrota, Minnesota, August 8, 1941, A. E. Pritchard.

Polyardis carpini (Felt), new combination

Campylomyza carpini Felt, Bull. N. Y. State Mus., 110: 100, 1907; Felt, Bull. N. Y. State Mus., 124: 314, 1908; Felt, Bull. N. Y. State Mus., 165: 171, 1907.

Campylomyza versicolor Felt, Bull. N. Y. State Mus., 124: 314, 1908. New synonymy.

Cordylomyia versicolor (Felt): Felt, Bull. N. Y. State Mus., 165: 198, 1913.

Polyardis carpini is a common species in Minnesota. The male is closely related to *vitinea,* but may be recognized by having thirteen flagellar segments with the stems of the middle segments slightly longer than the enlargements; and the tegmen rather broad, attenuating somewhat from the base, and distally somewhat angulate and evenly pigmented (Plate 2, fig. 11). The genital rod distally is somewhat enlarged and hastate.

The female of *carpini* is characterized by having the flagellar segments obconical, each densely set with sensory spines distally; the spermatheca very large, flattened and rounded, and less pigmented centrally; and the distal segment of the anterior tarsus not enlarged. The flagellum is nine segmented with the ninth segment compound or ten-segmented with the tenth segment compound, and all intergrades occur. The monotype female of *versicolor* agrees with females taken in association with *carpini* males in Minnesota. The flagellum of this monotype is nine-segmented with the ninth segment compound, the two components being about the same size and with a constriction between them, the spermatheca is collapsed, but obviously large.

Monotype.—Male, at the New York State Museum.

Types of synonyms.—*Versicolor:* monotype female, at the New York State Museum.

Specimens examined.—Minnesota: one male, Afton, May 10,

1941, A. E. Pritchard; one male, two females, Bemidji, July 31, 1941, A. E. Pritchard; one male, Detroit Lakes, June 20, 1941, A. E. Pritchard; one male, Grand Marais, August 2, 1941, H. Knutson; five males, Pine City, May 3, 1941, A. E. Pritchard; five males, three females, Pine City, August 4, 1941, A. E. Pritchard; one male, St. Paul, July 19, 1941, A. E. Pritchard; one male, Stillwater, September 6, 1941, A. E. Pritchard. New York: one male, Albany, June 1, 1906 (monotype of *carpini*); one female, Albany, July 17, 1906 (monotype of *versicolor*).

Polyardis aporia n. sp.

Polyardis aporia is closely related to *carpini* (Felt) with which species it agrees in having thirteen segments in the flagellum of the male. The male of *aporia* differs from *carpini* in having the stems of the middle flagellar segments slightly shorter than the enlargements, and the tegmen broadly rounded distally with a small but abrupt portion at the apex hyaline (Plate 2, fig. 12). These differences are not great, but the constancy of such characters is supported by the series at hand.

Three females collected in association with *aporia* in the field differ from the female of *carpini* only in having the spermatheca smaller and the distal segment of the anterior tarsus somewhat enlarged.

Holotype.—Male, Bemidji, Minnesota, July 31, 1941, A. E. Pritchard, at the University of Minnesota.

Paratypes.—Two males, three females, Afton, Minnesota, September 6, 1941, A. E. Pritchard; one male, Aitkin, Minnesota, July 9, 1941, A. E. Pritchard; one male, Bemidji, Minnesota, July 31, 1941, A. E. Pritchard; one male, Duluth, Minnesota, August 2, 1941, A. E. Pritchard; one male, Park Rapids, Minnesota, July 4, 1941, A. E. Pritchard; four males, Pine City, Minnesota, May 3, 1941, A. E. Pritchard; one male, Swan Lake, Minnesota, August 6, 1941, A. E. Pritchard.

Polyardis kasloensis (Felt), new combination

Campylomyza kasloensis Felt, Bull. N. Y. State Mus., 124: 314, 1908.

Cordylomyia kasloensis (Felt): Felt, Bull. N. Y. State Mus., 165: 199, 1913.

Campylomyza kasloensis Felt was based upon a single female specimen which cannot be definitely differentiated from the females of other species of *Polyardis* at the present time. This female is

very close to the monotype female of *versicolor,* but differs in having the branches of the cubital fork very distinct. The antennae of the *kasloensis* female are badly crumpled, but there are ten flagellar segments, the tenth segment being double. Spermathecae are absent in the mount. R_1 is a little over one and one-half times as long as R_s.

Monotype.—Female, at the U. S. National Museum.

Specimens examined.—British Columbia: one female, Kaslo, July 6 (not June 11), Dyar (not Currie) (monotype of *kasloensis*); one female, Kaslo, June 22, R. P. Currie.

Polyardis monotheca (Edwards), new combination

Monardia monotheca Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 241, 1938 (fig. wing, male genitalia, distal segments of anterior tarsus of female, antennal segments of female, spermatheca).

Edwards recently described *monotheca* from England. One female from Kaslo, B. C., checks perfectly with Edwards' description and figures of this sex. *Monotheca* is more distantly related to the other species of *Polyardis* because the sensorial processes on the female flagellum are in the form of discs, each bearing a curved and pointed projection which is directed towards one side. The male bears similar, but smaller sensorial processes on the proximal flagellar segments. There are four palpal segments.

Edwards discussed under *monotheca* another male which is a European representative of a species very similar to the other species here included in *Polyardis.*

Type.—Female, at the British Museum (Natural History).

Specimens examined.—British Columbia: one female, Kaslo, June 22, R. P. Currie.

Genus *Monardia* Kieffer

Monardia Kieffer, Misc. Ent., 3: 111, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 50, 1898; Felt, Jour. N. Y. Ent. Soc., 19: 35, 1911; Enderlein, Arch. Naturg., 77 (Bd. 1, Suppl. 3); 196, 1911; Felt, Bull. N. Y. State Mus., 165: 183, 1913; Kieffer, Gen. Insect., 152: 289, 1913; Edwards, Proc. Roy. Ent. Soc. Lond. 7 (ser. B): 236, 1938.

Pezomyia Kieffer, Bull. Soc. Hist. Nat. Afr. Nord, 4 (Ann. 5): 92, 1913; Kieffer, Gen. Insect., 152: 301, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 243, 1938. New synonymy.

Genotype.—Monobasic and by original designation, *Monardia stirpium* Kieffer.

Genotypes of synonyms.—*Pezomyia:* by original designation, (*Monardia vanderwulpi* de Meijere) = *Monardia stirpium* Kieffer.

The genus *Monardia* was originally proposed for a single species, *Monardia stirpium* Kieffer. Subsequently *Monardia* has included a number of heterogeneous species characterized by having four disc-like sensorial processes on each flagellar segment of the female. Felt, however, also included in *Monardia* species represented by females having other types of sensorial processes on the flagellum and males properly belonging to a number of other micromyine genera. Edwards refrained from restricting the limits of *Monardia,* particularly because there were no types of *stirpium,* the genotype, in Kieffer's collection, and he was unable to identify this species.

Six males and one female are in the Felt collection, each labelled, "*Monardia stirpium* K., type, from J. J. Kieffer." There is no reason to doubt that these are authentic cotypes. *Monardia stirpium* was based upon fully alate male and female specimens. These cotypes agree with the specimens described as the fully winged form of *Monardia vanderwulpi* de Meijere. De Meijere, on a basis of reared material, contended in describing *vanderwulpi* that the male occurred in a macropterous and a brachypterous form and that the female occurred in a brachypterous and an apterous form. Edwards (1925) expressed doubt as to whether the macropterous form was conspecific with the brachypterous form, but later, after examining both macropterous males and females, stated that they were structurally alike except for the wings. *Vanderwulpi* must be considered a synonym of *stirpium. Pezomyia,* a genus proposed by Kieffer, with *vanderwulpi* as genotype, must be considered a strict synonym of *Monardia.*

Monardia stirpium is distantly related to the other species now included in this genus. A generic diagnosis on a basis of this species is important for future revisers of *Monardia* and closely related genera. The essential characters of Kieffer's types of *stirpium* are as follows:

> A very small, yellowish species. Eye bridge three facets wide medially. Antenna of male with two plus twelve antennal segments, the flagellar segments stemmed, each with one incomplete crenulate whorl and with a small sensorial plate distally; antenna of female with two plus ten segments, the flagellar segments with short but distinct stems and each with four sensorial processes in the form of wrinkled discs, arising each from a single pore. Palpus three-segmented, the second and third segments very short. Tarsi with short bristles, without scales;

anterior tarsus of female with terminal segment somewhat over twice length of preceding segment (a little crumpled, but certainly not four times as long as penultimate segment); claws evenly curved, acutely pointed, somewhat dilated just beyond middle (scarcely evident in some views, appearing as a slight tooth in other views); empodium rudimentary. Wings (all dry mounts) small, rounded; R_1 slightly longer than R_s; r–m a little longer than R_s; M faint; Cu_2 evanescent distally. Male hypopygium with ninth tergum narrow; disticlasper with a single distal tooth (one of the small nodulate bristles distally may cause it to appear as two teeth as Kieffer described it); tegmen shield-shaped; genital rod long. Ovipositor with ninth abdominal segment (bearing the oviduct) short, only slightly longer than the length of the lamellae; lamellae largely distal to the ninth segment, with the proximal segment very short, the middle segment longer than broad, and the distal segment over twice as long as broad and wide proximally. Spermathecae two, round.

Monardia here includes those species having twelve flagellar segments in the male; the female flagellum with disc-like processes, each arising from a single pore or else plate-like processes, each arising from a number of pores; the empodium rudimentary; and the female with two spermathecae. In the present sense, *Monardia* includes three species groups in North America. One group is characterized by having R_1 very long, and the legs long and bristly; one group is characterized by having the sensoria of the female flagellum in the form of transverse plates, each arising from a number of small pores; and one group is characterized by having the sensorial processes as in *stirpium,* but the legs are clothed with rather dense and rather broad scales. The relationships of these groups and the species included within them can better be evaluated when the males are known. It is peculiar that the male genitalia of *Monardia lignivora* is so dissimilar to that of typical *Monardia,* when the male genitalia of species in other related genera very closely resemble the *Monardia* type.

A number of species of *Monardia* have been reared from dead wood. *M. lignivora* was reared from fungus-affected heartwood of pine, in North Carolina. In Europe, *ulmaria* was reared from a rotten elm stump, *stirpium* was reared from a decaying pine stump and from a decaying willow log, *antennata* was reared from decaying wood, and *kollari* emerged from birch detritus. None of the species seems to be commonly collected, however. Barnes (1928)

suggested that (*vanderwulpi*) = *stirpium* may reproduce by paedogenesis.

Key to North American Species (Females)

1. R_1 about twice the length of R_s or less; tarsal scales broad and dense 2
   R_1 four times the length of R_s; tarsal scales narrow and inconspicuous; very large species with very long legs. *canadensis* Felt
2. Flagellum with sensorial processes in the form of transverse plates, each arising from several small pores. *antennata* (Winnertz)
   Flagellum with sensorial processes in the form of wrinkled discs, each arising from one large pore 3
3. Spermathecae round ..... *multiarticulata* Felt
   Spermathecae pear-shaped, with the neck long and well differentiated ..... *lignivora* (Felt)

Monardia lignivora (Felt)

Campymyza lignivora Felt, Bull. N. Y. State Mus., 110: 100, 1907; Felt, Bull. N. Y. State Mus., 124: 314, 315, 1908.

Monardia lignivora (Felt): Bull. N. Y. State Mus., 165: 191, 1913 (fig. palp, ovipositor, photogr. larva).

Monardia lignivora is known only from the type series, from North Carolina. The female of this species may be recognized by the pear-shaped spermathecae. The male genitalia are distinctive, very dissimilar to the usual *Monardia* type. *M. lignivora* is closely related to the European *kollari* (Winnertz), but the eye bridge at origin on either side appears to be wider, and the spermathecae are more bulbous with the neck better differentiated.

Eye bridge four facets wide laterally at origin and mediodorsally. Palp four-segmented; first segment subglobular, with sensory spines inside; fourth segment somewhat longer than either second or third. Tarsi densely clothed with rather short scales; claws enlarged medially, with teeth proximally; empodium rudimentary. R_1 nearly twice length of R_s; r–m long, about twice length of R_s; M rather faint; Cu_2 evanescent on distal third.

Male.—Hypopygium with ninth tergum very broad, the anterior margin broadly and deeply triangular emarginate, nearly bisecting the tergum; basiclasper rather broadly united below, the basiclasper roots with a long, transverse bridge dis-

tally; disticlasper broadly rounded without a distal spine; tegmen short and broad, with a wide emargination medio-distally; genital rod long.

Female.—Flagellum with from seventeen to nineteen segments (intergrades occurring in the type series) and with very short stems; each segment with four sensorial processes in the form of wrinkled discs. Spermathecae two, large and bulbous with a long, narrow neck.

Lectotype.—Male, by present designation, at the U. S. National Museum.

Specimens examined.—North Carolina: six males, eighteen females (also six larvae and one pupal exuvium), Davidson's River, September 21, 1906, reared from fungus affected heartwood of pine (one male, two females, lectotype and paralectotypes of *lignivora,* at the U. S. National Museum; three females on slides and five males, thirteen females in alcohol, paralectotypes of *lignivora,* at the New York State Museum—the distal ends of the abdomens of four of the alcoholic females are mounted).

Monardia multiarticulata Felt

Monardia multiarticulata Felt, Psyche, 21: 109, 1914.

Monardia multiarticulata is known only from a single female from New Hampshire. This female resembles *lignivora,* but the spermathecae are rounded, and the flagellar segments are more numerous.

Female.—Eye bridge apparently broad. Antenna much as in *lignivora,* the flagellar enlargements wider than broad, the stems very short on proximal segments, somewhat shorter than the enlargements on the distal segments; each flagellar segment with sensoria in the form of wrinkled discs (one antenna badly shrivelled, with two plus twenty-five segments where it is broken off, the other antenna with only a few proximal segments remaining). Palp four segmented; first segment rather globular, with sensory spines inside; fourth segment a little longer than either second or third. Mesonotum densely clothed with hairs. Claws slightly widened medially, with teeth on proximal half; empodium rudimentary; tarsal scales long, but rather dense. Wings light brown, the area anterior to the radius darker; R_1 about twice the length of R_s; M faint; Cu_2 evanescent on distal third. Spermathecae two, dark, each with small neck of duct darkened.

Monotype.—Female, at the New York State Museum.

Specimens examined.—New Hampshire: one female, Franconia (monotype of *multiarticulata*).

Monardia canadensis Felt

Monardia canadensis Felt, Canad. Ent., 58: 267, 1926.

Monardia canadensis is a large species, known only from a single female from British Columbia. *Canadensis* is related to the European *magna* Edwards, but has the mesonotum rather uniformly and densely clothed with setae, and the distal third of Cu_2 is absent. R_1 is long, about four times the length of R_s; this is characteristic of *canadensis* and *magna*.

Female.—Eye bridge two facets wide at origin below, about four facets wide medio-dorsally. Antennal segments two plus twenty-five, the last segment compound and abnormally distorted, composed of four segments (only one antenna present); flagellar segments with enlargements broader than long, the stems about as long as the enlargements on proximal segments, considerably longer on distal segments; each enlargement distally with four sensorial processes in the form of discs with undulate sides. Palpi long, four-segmented; first segment enlarged, densely clothed with sensory spines inside; fourth segment not quite as long as preceding two. Mesonotum clothed rather uniformly with rather dense setae. Tarsi with many long and shorter bristles, with a few long, narrow scales; claws very long, with a median thickening and several teeth proximal to this; empodium rudimentary. Wings brownish, with dark infuscation along costa and radius and somewhat on media and cubitus; costal cell with a distinct bulge near middle; R_1 nearly four times the length of R_s; r–m about three times as long as R_s; M very plain; Cu_1 very long; Cu_2 absent on distal third. Spermathecae two, probably rounded, each with a small darkened neck to the duct.

One female in the Felt collection, bearing the same data as the monotype of *canadensis*, and determined by Felt as *?canadensis*, represents a new species more closely related to *magna*. This female (the antennae are missing) agrees with *magna* in that the mesonotum has a large bare area on either side of the dorso-central bristles, and Cu_2 extends to the margin, although thinner distally. It differs from *magna*, however, in having R_1 over six times as long as R_s, R_5 curving down a little at tip, and the costal cell not so obviously widened.

Monotype.—Female, at the New York State Museum.

Specimens examined.—British Columbia: one female, North Fork Wilson Creek, Michel, September 21, C. Garrett, 5200 ft. (monotype of *canadensis*).

Monardia antennata (Winnertz)

Campylomyza antennata Winnertz, Verh. Zool.-Bot. Ges. Wien, 20: 23, 1870.

Xylopriona antennata (Winnertz): Kieffer, Gen. Insect., 152: 291, 1913.

Monardia antennata (Winnertz): Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 237, 1938 (fig. wing, male genitalia, female antenna, distal tarsal segments, claws, spermatheca, and ovipositor).

Monardia antennata is here recognized for the first time in North America. The female is characterized by having the sensoria of each flagellar segment in the form of three or four broad plates, each arising from a number of small pores. The male has two crenulate whorls on each flagellar segment, and the disticlasper distally is broadly rounded, without a terminal spine. The empodium is rudimentary.

Type.—Female, at the University of Bonn.

Specimens examined.—Minnesota: one female, Stillwater, September 6, 1941, A. E. Pritchard.

Genus *Trichopteromyia* Williston

Trichopteromyia Williston, Trans. Ent. Soc. Lond., 1896; 255, 1896; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 9: 16, 1901; Felt, Jour. N. Y. Ent. Soc., 19: 33, 1911; Felt, Bull. N. Y. State Mus., 165: 161, 1913; Kieffer, Gen. Insect., 152: 317, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 235, 1938.

Projoannisia Kieffer, Neue Gallm.-Gatt., p. 2, 1912 (reprinted in Marcellia, 11: xi, 1913); Kieffer, Gen. Insect., 152: 294, 1913.

Genotype.—Monobasic, *Trichopteromyia modesta* Williston.

Genotype of synonyms.—*Projoannisia:* monobasic and by original designation, (*Joannisia latipennis* Kieffer) = *Trichopteromyia modesta* Williston.

The genus *Trichopteromyia* was originally based upon specimens from the West Indies. Edwards has shown that this genus occurs in England, and it is here recorded from the United States for the first time.

Trichopteromyia is closely related to *Monardia* which it resembles in most respects. The eye bridges of *Trichopteromyia* are very broad, however, about six facets wide medio-dorsally, somewhat wider laterally. The wing venation is similar to that of *Monardia;* R_1 is hardly twice as long as R_s; media and the cubital branches are very faint. The claws are slender, slightly enlarged medially; the empodium is rudimentary. The male genitalia are of the *Monardia* type. The female differs from *Monardia* in having the sensorial processes of the flagellum disc-like with a long, attenuated distal extension, and the two spermathecae are retort-shaped.

T. modesta is the only species known in the genus. Only a few specimens of *modesta* have been collected in the United States. Nothing is known concerning the biology of this species.

Trichopteromyia modesta Williston

Trichopteromyia modesta Williston, Trans. Ent. Soc. Lond., 1896: 255, 1896 (fig. wing, tarsus, and portion of flagellum); Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 235, 1938 (fig. head, wing, male genitalia, female antenna, and ovipositor).

Campylomyza flavoscuta Felt, Bull. N. Y. State Mus., 110: 97, 1907; Felt, Bull. N. Y. State Mus., 124: 313, 1908; Felt, Bull. N. Y. State Mus., 165: 169, 1913. New synonymy.

Projoannisia latipennis Kieffer, Neue Gallm.-Gatt., p. 2, 1912 (reprinted in Marcellia, 11: xi, 1913): Kieffer, Gen. Insect., 152: 294, 1913 (fig. wing).

Monardia rugosa Felt, Psyche, 21: 110, 1914. New synonymy.

Otherwise than the characters mentioned in the generic discussion, this species may be recognized by having the palpus three-segmented, with the third segment twice as long as the preceding segment. The male is further characterized by having the disticlasper noticeably attenuated from the base. The monotype male of *Campylomyza flavoscuta* Felt represents this species. The head of Felt's type is largely broken off, but a portion of the eye bridge is left; the palpi are missing. The male genitalia of *flavoscuta* are a little askew, but appear to be the same, the disticlasper typically tapering to a point.

The female of *modesta* has ten flagellar segments, the stems being about three-fourths the length of the enlargements on the distal segments, considerably shorter on proximal segments. The spermathecae are rather small, oblong-oval, with a large neck doubled back. The monotype female of *Monardia rugosa* Felt represents the female of *modesta.*

Types.—Two cotype females, one in the British Museum (Natural History).

Types of synonyms:—*Flavoscuta:* monotype male, at the New York State Museum; *latipennis:* type female, at the British Museum (Natural History); *rugosa:* monotype female, at the New York State Museum.

Specimens examined.—MINNESOTA: one male, Frontenac, May 29, 1941, A. E. Pritchard. NEW HAMPSHIRE: one female, Hanover, July 5 (monotype of *rugosa*). NEW YORK: one male, Albany, June 4, 1906 (monotype of *flavoscuta*).

Genus *Micromya* Rondani

Micromya Rondani, Sopra Alc. Gen. Inset. Ditt., Mem. Sec. Serv. Ditt. Ital., p. 21, 1840; Rondani, Nuov. Ann. Sci. Nat. Bologna, (ser. 2) 6: 373, 1846; Rondani, Dipt. Ital. Prod., 1: 198, 1856.

Micromyia Rondani (emendation for *Micromya*): review of Rondani's 1840 paper, Isis von Oken, 1844: 451, 1844; Winnertz, Verh. Zool.-Bot. Ges. Wien, 20: 26, 1870; van der Wulp, Dipt. Neerl., p. 78, 1877; Kieffer, Misc. Ent., 3: 112, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 50, 1898; Kieffer, Ann. Soc. Ent. France, 69: 441, 1900; Felt, Jour. N. Y. Ent. Soc., 19: 34, 1911; Enderlein, Arch. Naturg., 77 (Bd. 1, suppl. 3): 196, 1911; Kieffer, Gen. Insect., 152: 294, 1913; Felt, Bull. N. Y. State Mus., 165: 163, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 254, 1938.

Ceratomyia Felt, Jour. N. Y. Ent. Soc., 19: 33, 1911; Felt, Bull. N. Y. State Mus., 165: 162, 1913; Kieffer, Gen. Insect., 152: 317, 1913. New synonymy.

Crespiniella Kieffer, Broteria, 21 (ser. zool.): 88, 1924. New synonymy.

Genotype.—Monobasic, *Micromya lucorum* Rondani.

Genotype of synonyms.—*Ceratomyia:* monobasic, and by original designation, *Ceratomyia johannseni* Felt; *Crespiniella;* monobasic, *Crespiniella sahariensis* Kieffer.

The original spelling of the genus *Micromya* Rondani must be retained, since evidence of the derivation of the word is not contained in the original publication. Moreover, Rondani consistently used this spelling, showing that he wished it to be spelled this way.

Micromya may be recognized by having the antenna of the male with the pedicel enlarged and globular, the flagellum very slender,

seven- or eight-segmented, the sensoria forming an incomplete ring distally on each segment. The palpus of the male is distinctive, three segmented; the first segment is somewhat enlarged, globular; the second segment is long and slender, articulated to the ventral side of the first segment; the third segment is rather short and conical. The palpus of the female is similar to the male, but the second segment is not as slender and often proportionally shorter. The claws are longer in the male than in the female; the empodium is nearly as long as the claws, very narrow. The wings have the cubital fork very wide, nearly right-angled. The hypopygium is in many respects similar to the *Monardia* type, but the basiclaspers below are very broadly approximate, united only proximally; the genital rod is short. There is a single spermatheca.

The genus *Ceratomyia* Felt is a synonym of *Micromya*. This genus was proposed for a species from Mexico and has not subsequently been recognized. Felt stated that *Ceratomyia* was distinct from *Micromya* because of the absence of the fourth vein in the former genus, although he had described the fourth vein as being indistinct in Winnertz's material of *Micromya lucorum* which he had studied in Europe; this character is of little significance. Felt further emphasized the presence of only six antennal segments in the male of *Ceratomyia*, basing his conclusion on a specimen having the distal flagellar segments broken off. This specimen represents a species which is very similar to, if not synonymous with, the genotype of *Micromya*.

The genus *Crespiniella* Kieffer is a synonym of *Micromya*. *Crespiniella* was originally proposed by Kieffer for specimens from Algeria, and the genus has not subsequently been discussed nor recognized. This genus was characterized as being related to *Ceratomyia* Felt, but differing in having more than six antennal segments. The description of the antennae, palpi, claws, and wings of the genotype, *Crespiniella sahariensis* Kieffer, clearly indicates that this species is very similar to, if not synonymous with, the genotype of *Micromya*. It is significant that Kieffer did not recognize the genus *Micromya* for any material on which he published.

Micromya is here recorded from the United States for the first time. Two species are common in Minnesota. Nothing is known of the biology of species in this genus.

Micromya johannseni (Felt), new combination

Ceratomyia johannseni Felt, Jour. N. Y. Ent. Soc., 19: 33, 1911; Felt, Bull. N. Y. State Mus., 165: 163, 1913.

Micromya johannseni is very similar to *lucorum* as redescribed and figured by Edwards on a basis of Winnertz's identification of that species. North American material differs from Edwards' figures in having the claws somewhat shorter than the fifth tarsal segment and very strongly curved at almost right angles (Plate 1, fig 4). It seems preferable to retain Felt's name because of this discrepancy. The tegmen of the male hypopygium of *johannseni* also differs from that figured by Edwards; but this structure is often indistinct, and a protrusion of the genital duct may occupy the genital cavity and appear similar to Edwards' figure.

Edwards stated that he had examined a series of males from Africa which were similar to European males of *lucorum*. The claws of the African *sahariensis* (a species which Edwards overlooked) were described as being strongly curved. It is possible that Edwards' figure of the claws is misleading. The description of *sahariensis* agrees very well with *johannseni* except that the sensoria of the male flagellum are not mentioned nor those of the female flagellum adequately described; these sensorial processes are often difficult to see.

The monotype of *johannseni* is a broken male. Only one leg is present on the slide, but the claws are lengthened and very strongly arched. The antennae are obviously broken, with only four flagellar segments remaining; the sensoria are narrow, horseshoe-shaped. The disticlasper of this specimen has an inner spine predistally. This spine was not present in Edwards' material of *lucorum* nor in Kieffer's male of *sahariensis*. In the Minnesota males, the character of the spine on the disticlasper is somewhat variable, but is usually present. The tegmen is triangular, very lightly sclerotized. The wings are broadly rounded and hyaline.

The female of *johannseni* is very similar to that of *lucorum*. The sensorial process of each flagellar segment forms a rather wide distal cup arising from a number of small pores, incomplete on one side (sometimes both sides) where the ends of the process form long projections. The claws are heavy, distinctly widened predistally, and less than half the length of the fifth tarsal segment.

Monotype.—Male, at the New York State Museum.

Specimens examined.—Minnesota: one male, Appleton, August 10, 1941, A. E. Pritchard; one male, Crookston, July 29, 1941, A. E. Pritchard; one male, Hallock, May 23, 1938, A. E. Pritchard; two males, one female, Mentor, July 30, 1941, A. E. Pritchard; one male, Stillwater, September 6, 1941, A. E. Pritchard; one male, Tenney, June 19, 1941, A. E. Pritchard. Mexico: one male, Ocotlán, O. A. Johannsen (monotype of *johannseni*).

Micromya mana n. sp.

Micromya mana is closely related to *johannseni* from which it differs in the male sex by having the sensorial processes of the proximal flagellar segments awl-like and oblique, the claws less enlarged, being less than one-half the length of the fifth tarsal segment (Plate 1, fig. 3). The tegmen is more heavily sclerotized, and the disticlasper usually bears no distal spine. The female of *mana* differs from *johannseni* in having the sensorial processes of the flagellum forming an irregular and thread-like, incomplete ring, the claws slenderer and not distinctly widened predistally. The wing of *mana* is distinctly slenderer and somewhat darker than *johannseni.*

A small, light brownish species. Eye bridge about two facets wide laterally, wider above, but immediately narrowed at the medio-dorsal line. Tarsal scales long, rather broad, dense. Wings elongate, light brownish, the macrotrichia moderately dense; R_1 slightly longer than R_s; M faint but evident; Cu with fork wide, the branches evanescent only at distal ends; Cu_2 curved proximally. Length of wing, 1.2 mm.

Male.—Antenna with pedicel strongly enlarged, broader than long; flagellum slender, seven segmented, the terminal segment being elongate and compound, composed of two (or three) partially divided segments (rarely subdivided to form eight flagellar segments); each flagellar segment with a sub-basal whorl of long bristles which are wide apart on ventral side, with several small distal bristles, and proximal segments with a small, thin, oblique, awl-shaped sensory process which is often curved. Palp three segmented; first segment globular, densely clothed above with sensory bristles; second segment long and slender and slightly enlarged distally, articulated to the ventral side of first segment; third segment one-half length of second, tapering distally. Claws slender, simple, strongly curved at nearly right angles, about one-half length of fifth segment; empodium not quite as long as claws, very narrow, with long hairs below. Hypopygium with ninth tergum narrow, the tenth tergites a pair of large setose lobes; basiclaspers below very broadly approximate, but divided in large part by a deep triangular emargination; basiclasper roots convergent, distally united by a wide bridge, broadly connected by a pair of arms to the base of the tegmen; tegmen triangular; genital rod short but distinct.

Female.—Flagellum eight-segmented; each segment obconical, with a proximal whorl of bristles, and distally with a

narrow, irregular, sensorial ring, incomplete on one side (sometimes more), and with the ends produced. Palp with the second segment broader and sometimes proportionally shorter than in the male. Claws shorter and a little heavier than in the male. Lamellae of ovipositor short and broad. Spermatheca large, flattened, rounded, with a peripheral neck for the duct. Abdomen containing a large number of eggs.

Holotype.—Male, St. Paul, Minnesota, July 19, 1941, A. E. Pritchard, at the University of Minnesota.

Paratypes.—One male, Afton, Minnesota, May 10, 1941, A. E. Pritchard; one male, Anoka, Minnesota, September 11, 1941, A. E. Pritchard; two males, three females, Bemidji, Minnesota, July 31, 1941, A. E. Pritchard; one male, Brownsville, Minnesota, May 29, 1941, A. E. Pritchard; one male, Duluth, Minnesota, August 2, 1941, A. E. Pritchard; one female, John Latch State Park, Minnesota, May 29, 1941, A. E. Pritchard; six males, three females, Mentor, Minnesota, July 31, 1941, A. E. Pritchard; one male, Pine City, Minnesota, August 4, 1941, A. E. Pritchard; two males, Shevlin, Minnesota, July 30, 1941, A. E. Pritchard; four males, Tenstrike, Minnesota, July 31, 1941, A. E. Pritchard.

Genus *Mycophila* Felt

Mycophila Felt, Jour. N. Y. Ent. Soc., 19: 33, 1911; Felt, Bull. N. Y. State Mus., 165: 161, 1913; Kieffer, Gen. Insect., 152: 288, 1913; Barnes, Ent. Mo. Mag., (ser. 3) 63: 164, 1927; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 253, 1938.

Genotype.—Monobasic and by original designation, *Mycophila fungicola* Felt.

The genus *Mycophila* was proposed by Felt for a very small species from California. Barnes later recognized this genus for a species occurring in England. Edwards recently confirmed the generic reference for the English species and described an additional species from England.

Mycophila is characterized by having the flagellum of the male with only eight to ten segments, the stems short; and female with seven to nine flagellar segments and each segment with a pair of sensorial processes which are rather broad and lobed or digitate distally, each arising from a number of pores or with the pores confluent. The empodium is short or rudimentary. The male genitalia are of a distinctive type, the tegmen being somewhat slipper-shaped and the genital rod entirely absent.

Mycophila fungicola Felt was reared from mushrooms, in Cali-

fornia. In England, *speyeri* (Barnes) was reared from mushroom mycelia, and *barnesi* Edwards was reared from mushrooms and from manure. Barnes has shown that paedogenesis occurs in *speyeri,* and it is probable that the other species of *Mycophila* also reproduce paedogenetically.

Mycophila fungicola Felt

Mycophila fungicola Felt, Jour. N. Y. Ent. Soc., 19: 33, 1911; Felt, Bull. N. Y. State Mus., 165: 161, 1913 (fig. wing, male and female antennal segments).

The specimens on which this genus and species were originally based are a male and female in poor condition. The flagellum of the male is nine-segmented, the ninth segment compound, but incompletely divided. The flagellum of the female is seven-segmented, the seventh segment compound; the sensorial processes are digitate distally. The palpi are not visible. The empodium is one-half the length of the claws (not rudimentary) in the male and a little shorter in the female. The male hypopygium is mounted laterally, so that its characters cannot be ascertained. The spermatheca is broadly oval in shape.

Lectotype.—Male, by present designation, at the U. S. National Museum.

Specimens examined.—CALIFORNIA: one male, one female, San Rafael, September 7, 1897, reared from mushrooms (lectotype and paralectotype of *fungicola*).

Mycophila lampra n. sp.

Mycophila lampra is a small species, resembling *speyeri* (Barnes) in having the empodia rudimentary, but differing from that species in having the palpus three segmented and the sensorial processes of the female with long distal projections. The male hypopygium is distinctive in having the ninth tergum very broad, with the anterior margin broadly and deeply emarginate, and the basiclaspers narrowly approximate below (Plate 2, fig. 14).

Eye bridge two facets wide. Palpus short, three-segmented; first segment rather large, globular, with sensory bristles scattered above; second segment articulated to the ventral side of the first; third segment rather attenuating (rarely indistinctly separated from the second). Mesonotum with only dorso-central and lateral bristles. Tarsi densely clothed with long, rather broad scales; claws evenly curved, acute; empodium rudimentary, represented by a few hairs. Wings rather

densely clothed with macrotrichia; R_1 slightly shorter than length of R_s; M and Cu very faint; cubital fork very acute; Cu_2 curved. Wing length, 0.9 mm.

Male.—Flagellum eight-segmented, the eighth segment simple (or compound with a medial constriction); segmental stems one-third the length of the enlargements, lacking (or very short) on penultimate segment; each segment medially with an oblique crenulate whorl in which the bristles below are wide apart and indistinctly crenulate; postmedially with a row of bristles above, and distally with several bristles and two sensory peg-like bristles. Hypopygium with ninth tergum wide laterally and very narrow medially, the anterior margin forming a broadly rounded and deep emargination; tenth tergites a pair of widely separated setose lobes; basiclasper below with a narrow proximal portion approximate but narrowly divided; basiclasper roots united and forming a broadly rounded arch; disticlasper attenuated only at distal end, terminated by a long, acute, inwardly directed spine; tegmen elongate, nearly parallel sided, broadly rounded distally, with heavily pigmented proximolateral roots, and either side broadly curved inwards and proximally continuous with ventral arms of the arch of the basiclasper roots; genital duct from the two elongate testes ending as a membranous tube between the sides of the tegmen.

Female.—Flagellum eight-segmented, the eighth segment compound, constricted medially; segments obconical, the distal stems slight; sensorial processes two to a segment (rarely one of these divided), each process rather broad and typically extended into a pair of long, divergent, distal lobes, and each arising from one large pore formed by union of several smaller pores. Lamellae of ovipositor short and broad. Spermatheca one, subovate and with a small portion bearing the duct bent back. Abdomen containing several large eggs.

Holotype.—Male, St. Paul, Lake Johanna, Minnesota, July 19, 1941, A. E. Pritchard, at the University of Minnesota.

Paratypes.—One female, St. Paul, Minnesota, July 19, 1941, A. E. Pritchard; one male, Hudson, Wisconsin, September 1, 1941, A. E. Pritchard.

Genus *Bryomyia* Kieffer

Bryomyia Kieffer, Misc. Ent., 3: 78, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 49, 1898; Felt, Jour. N. Y. Ent. Soc., 19: 35, 1911; Enderlein, Arch. Naturg., 77 (Bd.

1, Suppl. 3) : 196, 1911; Felt, Bull. N. Y. State Mus., 165 : 193, 1913; Kieffer, Gen. Insect., 152: 298, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B) : 208, 1938.

Genotype.—Monobasic and by original designation, *Bryomyia bergrothi* Kieffer.

The genus *Bryomyia* comprises a homogeneous group of species. The male may be recognized by the distinctive genitalia. The ninth tergum is broad, variously developed; the basiclaspers are broad, the basiclasper roots having strongly developed ventral arms; the disticlasper has no distal spine; the tegmen is weakly sclerotized and usually membranous, proximally deeply emarginate with the center of the emargination usually strongly developed; the genital rod is very short, but bears a pair of long processes which support a membranous enlargement. Each flagellar segment bears a complete crenulate whorl and three incomplete crenulate whorls beyond this which successively shorten in length. The palp is four segmented, but the third and fourth segments may sometimes be fused. The tarsi are densely clothed with short broad scales; the empodium is somewhat shorter than the claws and very narrow or rudimentary.

The female of *Bryomyia* may be recognized by having on each flagellar segment two sensory processes which are variously developed. There are two large, rounded, and lightly pigmented spermathecae.

In the Felt collection, there are two males and two females of the genotype, *Bryomyia bergrothi* Kieffer, from J. J. Kieffer (not labelled types, however). These specimens confirm Edwards' identification of the genotype. The ninth tergum of the male hypopygium is similar to that figured by Edwards as a variety of *bergrothi*.

Bryomyia is here recorded from North America for the first time, although several species belonging here were described by Felt in other genera. The species of *Bryomyia* are not especially common. The Minnesota material was collected in well shaded and damp woods. One species, *bergrothi*, was reared from moss by Kieffer, in Europe. It is possible that the other species breed in similar habitats.

Key to North American Species (Males)

1. Disticlasper plump, with a long, bare, dorsal flange 2
   Disticlasper compressed, the lower portion folded under, and without a dorsal flange 3
2. Ninth tergum strongly bilobed, the lobes bare; bridge of basiclasper roots broadly rounded ..... *gibbosa* (Felt)

Ninth tergum with a distal, pubescent projection on either side; bridge of basiclasper roots transverse ..... *cambrica* Edwards

3. Disticlasper with a strong, angulate projection above at proximal angle ..... *producta* (Felt)

Disticlasper without the proximo-dorsal angle strongly produced ..... *apsectra* Edwards

Bryomyia producta (Felt), new combination

Campylomyza producta Felt, Bull. N. Y. State Mus., 124: 315, 1908; Felt, Bull. N. Y. State Mus., 165: 166, 1913 (photogr. wing, male genitalia).

Bryomyia producta, previously known from a single male from New York, is here recorded from northern Minnesota and southern Ontario. The male may be easily recognized by the thumb-like projection situated proximo-dorsally on the disticlasper and directed inwards (Plate 2, fig. 9). The female is unknown. The hypopygium for which Felt has presented a photograph is inverted.

Male.—Flagellum with stems of middle segments about one-half the length of the enlargements. Empodium slightly over half the length of claws. Hypopygium with ninth tergum very broad, clothed with very long bristles and entirely pubescent; anterior margin of ninth tergum broadly and deeply emarginate, and emargination triangular with sinuate sides; ninth tergum distally and medially less pigmented, the posterior margin broadly and shallowly emarginate; tenth tergites a pair of wide, setose lobes; basiclaspers below with inner, distal margins broadly rounded, but with a darkened ridge extending ventrally from the basiclasper roots; basiclasper roots convergent, with a short and broad ridge distally, the ventral arms wide, broadly rounded and approximate medially, disticlasper laterally compressed, ventrally turned inwards, the proximo-dorsal angle inside with an acutely angular projection; tegmen broad, weakly sclerotized, distally extending nearly to end of basiclaspers, proximally deeply and roundly emarginate, the center of the emargination strongly sclerotized and projecting dorso-posteriorly; genital rod rather long, extending into a divergently forked process which supports a large distally widened, membrane.

Monotype.—Male, at the New York State Museum.

Specimens examined.—Minnesota: one male, Duluth, August 2, 1941, A. E. Pritchard; one male, Tenstrike, July 31, 1941, A. E. Pritchard. New York: one male, Nassau, July 31, 1906 (monotype

of *producta*). Ontario: one male, Middle Falls, August 3, 1941, A. E. Pritchard.

Bryomyia apsectra Edwards

Bryomyia apsectra Edwards, Proc. Roy. Ent. Soc., Lond., 7 (ser. B) : 210, 1938 (fig. wing, male genitalia, female flagellar segments).

Bryomyia apsectra is closely related to *producta* from which species it differs in the male sex essentially in having the empodia rudimentary and the disticlasper of the male genitalia without a strong, proximo-dorsal projection. The male hypopygium is otherwise very similar to that of *producta*. Edwards has not clearly illustrated the complex nature of the phallic structures, but there is very little doubt that Minnesota specimens represent the same species.

The female is characterized by the long and slender flagellar segments, each segment being rather attenuated to the distal stem and bearing a pair of long sensorial processes which are broad proximally, tapering and usually curved distally; the sensorial processes are sometimes distally bifid.

Type.—Male, at the British Museum (Natural History).

Specimens examined.—Minnesota: three males, two females, Grand Marais, August 2, 1941, A. E. Pritchard and H. C. Knutson; two males, Nisswa, July 8, 1941, A. E. Pritchard.

Bryomyia gibbosa (Felt), new combination

Campylomyza gibbosa Felt, Bull. N. Y. State Mus., 110: 100, 1907; Felt, Bull. N. Y. State Mus., 124: 316, 1908; Felt, Bull. N. Y. State Mus., 165: 169, 1913.

Campylomyza cerasi Felt, Bull. N. Y. State Mus., 110: 101, 1907; Felt, Bull. N. Y. State Mus., 124: 316, 1908; Felt, Bull. N. Y. State Mus., 165: 168, 1913. New synonymy.

Neptunimyia flavida Felt, Jour. N. Y. Ent. Soc., 27: 279, 1919. New synonymy.

The male of *gibbosa* may be recognized by the form of the male hypopygium (Plate 2, fig. 8). The ninth tergum bears distally a pair of large, sclerotized bare lobes; the basiclasper below has the inner, distal angles produced and setose; the disticlasper above bears a long, bare sclerotized flange; the tegmen is broad and long, proximally with a deep, median emargination which becomes very narrow mediodorsally; genital rod very short, bearing a pair of long processes which diverge distally and support a membranous structure.

The hypopygium of the monotype male of *Campylomyza cerasi* Felt is inverted, but is similar to that of the monotype male of *gibbosa*. The empodium of *gibbosa* is characteristically slightly over one-half of the length of the claws. The empodium of the monotype male of *cerasi* is very difficult to see clearly, but appears to be less than half the length of the claws.

The female of *gibbosa* may be recognized by having the flagellar segments with long stems and each segment provided with a pair of sensorial processes each of which is split into three to five long, slender prongs. The monotype female of *Neptunimyia flavida* Felt is a small, yellowish specimen, with the media simple, the cubitus forked, the legs short and densely scaled, the ovipositor slender, and with spermathecae present, two in number. This specimen, which is not closely related to (*Neptunimyia* Felt) = *Anaretella* Enderlein nor other genera of the tribe LESTREMIINI, is here considered the female of *gibbosa*.

Bryomyia trifida Edwards (European) is very similar to *gibbosa* and may be the same as this species. The North American males differ from Edwards' figure of the hypopygium principally in having the broad, bare lobes of the ninth tergum more angulate distally and more widely divergent. The females of the two species are very similar. This, together with the fact that a male and female were collected at the same time and place, leads the writer to consider *flavida* as a synonym of *gibbosa*.

Type.—Monotype male, at the New York State Museum.

Types of synonyms.—*Cerasi:* monotype male, at the New York State Museum; *flavida:* monotype female, at the New York State Museum.

Specimens examined.—MINNESOTA: one male, one female, Grand Marais, August 2, 1941, H. C. Knutson. NEW YORK: one male, Lake Clear, June 7, 1906 (monotype of *gibbosa*): one female Keene Valley, August 20, 1917, H. Notman (monotype of *flavida*); one male, Nassau, May 15, 1906 (monotype of *cerasi*).

Bryomyia cambrica Edwards

Bryomyia cambrica Edwards, Proc. Roy. Soc. Lond., 7 (ser. B): 210, 1938 (fig. male genitalia).

Bryomyia cambrica was recently described for a single male specimen from England. Two males from Minnesota are very similar to *cambrica* and are here regarded as that species, although Edwards has not figured the details of the phallic structures. The female has not been recognized.

Cambrica is closely related to *gibbosa,* but the empodia are rudimentary and the hypopygium differs considerably. The ninth tergum is broad, the caudal margin broadly and roundly emarginate, the caudo-lateral angles angulately produced and pubescent; the basiclasper is subtruncate distally, with the inner distal angles very dark, somewhat produced and setose, and distally and above with a small, setose protuberance; the basiclasper roots are distally connected by a long, transverse bridge; the disticlasper is plump, the distal, inner angles somewhat irregular, and the dorsal surfaces with a long, bare flange; the tegmen is rather broad, rounded distally, the proximo-lateral roots strongly developed, pigmented and each bearing a small inwardly directed lobe; structure of genital rod not apparent.

Monotype.—Male, at the British Museum (Natural History).

Specimens examined.—MINNESOTA: two males, Grand Marais, August 2, 1941, A. E. Pritchard.

Genus *Aprionus* Kieffer

Apriona Kieffer (not Chevrolat, 1852, Coleoptera), Bull. Soc. Ent. France, 1894: clxxvi, 1894.

Aprionus Kieffer (new name for *Apriona* Kieffer), Wien, Ent. Ztg., 13: 205, 1894; Kieffer, Misc. Ent., 3: 93, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 49, 1898; Felt, Jour. N. Y. Ent. Soc., 19: 34, 1911; Enderlein, Arch. Naturg., 77 (Bd. 1, Suppl. 3): 196, 1911; Felt, Bull. N. Y. State Mus., 165: 182, 1913; Kieffer, Gen. Insect., 152: 300, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 229, 1938.

Genotype.—By subsequent designation of Kieffer, 1895, *Aprionus spinigera* Kieffer (the original spelling of the specific name must be retained).

Genotype of homonym.—*Apriona: ipso facto, Aprionus spinigera* Kieffer.

The genus *Aprionus* comprises a homogeneous group of species. The male hypopygium is distinctive in having the ninth tergum very broad, the basiclaspers very long, with the proximal ends below narrowly united, and the tegmen laterally bearing opposing pairs of spines which are directed inwardly. The genital rod is absent, but a membranous and setose genital sac is located below the tegminal spines. The palp of a single species commonly varies from being three to four segmented. The empodium is rudimentary or short and narrow, not over one-half the length of the claws.

The female of *Aprionus* may be recognized by the single spermatheca, in correlation with a short or rudimentary empodium and the characteristic sensorial processes of the flagellum. These processes are elongate or transverse, sometimes digitate, and although they are commonly four to a segment, may be more abundant.

There are specimens of *Aprionus miki* Kieffer (not labelled types, however) in the Felt collection, and also other specimens of *Aprionus* from Kieffer bearing a manuscript specific name.

The genus *Aprionus* is probably very large, although specimens of this genus are not very commonly collected. *A. pinicorticis* was reared from scolytid galleries in pine, in New Jersey. Kieffer and Winnertz reared a number of European species from logs or stumps of oak, willow, horn-beam, pine, and beech; one species was also reared from galleries of a scolytid under the bark of pine.

Aprionus asemus n. sp.

Aprionus asemus is closely related to the European *spinigera* Kieffer, but differs from that species in having the disticlasper with a bare and truncate, terminal projection, and tegmen with only four pairs of spines (Plate 2, fig. 15). The female has not been recognized.

Male.—Eye bridge on either side above about four facets wide. Flagellum with stems about as long as the nodes, each node with one complete and two incomplete crenulate whorls and above with distal spines. Palp four-segmented. Mesonotum with bristles mostly dorso-central and lateral. Tarsi clothed with rather narrow scales; claws bent, slightly widened beyond middle, with small teeth medially; empodium rudimentary. Wings with R_1 twice the length of R_s. Hypopygium: ninth tergum very broad, truncate; basiclaspers long, below rather narrowly united proximally, the space between the basiclaspers below flask-shaped, but not strongly narrowed distally, the ventral arms broadly united with the tegmen; disticlasper short, but deep proximally, narrow, with a short and broadly truncate, bare projection distally; tegmen elongate, the proximal angles not projecting anterior to the basiclasper bridge; tegmen laterally and above with four pairs of inwardly directed spines set almost at right angles, distally with a broadly rounded, weakly sclerotized cap enclosing the distal end of the large elliptical, setose, membranous modification at the end of the genital duct. Length of wing, 0.8 mm.

Holotype.—Male, Bayport, Minnesota, May 10, 1941, A. E. Pritchard, at the University of Minnesota.

Paratypes.—Three males, Hawley, Minnesota, July 25, 1941, A. E. Pritchard.

Aprionus monticola (Felt), new combination

Campylomyza monticola Felt, Jour. N. Y. Ent. Soc., 27: 281, 1919.

Aprionus monticola is known from a single male specimen from New York. The hypopygium of this specimen is distinctive; the basiclasper bears a long, angulate projection distally and below, and has a rounded projection inside predistally. The disticlasper is short, broadly rounded above, but with the inside concave below and narrowing to an acute apex. The tegmen bears three or four pairs of strong teeth.

Monotype.—Male, at the New York State Museum.

Specimens examined.—New York: one male, Keene Valley, H. Notman (monotype of *monticola*).

Aprionus pinicorticis (Felt), new combination

Campylomyza pinicorticis Felt, Bull. N. Y. State Mus., 124: 315, 1908.

Monardia pinicorticis (Felt): Felt, Bull. N. Y. State Mus., 165: 188, 1913.

Aprionus pinicorticis is known only from a single female specimen from New Jersey. The flagellum of this specimen is eleven-segmented, the distal segment strongly constricted beyond the middle; the middle segments bear necks which are about one-third the length of the proximal enlargement, the necks being formed by a constriction beyond the sensoria which is wider than the very short distal stem of articulation. The flagellar sensoria are short and broad, each arising from a number of small pores which are often coalesced to form a large, irregular, transverse pore; typically sensoria four to a segment, but sometimes divided. The palp is four segmented. The empodium is rudimentary. R_1 is nearly twice the length of R_s. There is a single spermatheca which is rather large, somewhat ovoid.

Monotype.—Female, at the New York State Museum.

Specimens examined.—New Jersey: one female, Riverton, April 14, 1901 [reared from galleries of a scolytid in pine, by C. W. Johnson] (monotype of *pinicorticis*).

Aprionus longipennis (Felt), new combination

Campylomyza longipennis Felt, Bull. N. Y. State Mus., 124: 314, 1908.

Prionellus longipennis (Felt): Felt, Bull. N. Y. State Mus., 165: 176, 1913.

Aprionus longipennis is known from a single female specimen from New York. This female is very similar to *pinicorticis* from which it differs in having each flagellar segment more evenly attenuated distally and with a very short neck, the terminal flagellar segment simple, and the spermatheca a little smaller and more evenly ovate. The flagellar sensoria are transverse, each arising from a transverse pore formed by the union of a number of small pores.

Monotype.—Female, at the New York State Museum.

Specimens examined.—New York: one female, Albany, August 2, 1906 (monotype of *longipennis*).

Genus *Peromyia* Kieffer

Joannisia Kieffer (not Monterosato, 1884, Mollusca), Bull. Soc. Ent. France, 1894: clxxv, 1894; Kieffer, Wien. Ent. Ztg., 13: 205, 1894; Kieffer, Misc. Ent., 3: 62, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 48, 1898; Coquillett, Proc. U. S. Nat. Mus., 37: 556, 1910; Felt, Jour. N. Y. Ent. Soc., 19: 32, 1911 (misspelled as *Joanissia*); Enderlein, Arch. Naturg., 77 (Bd. 1, Suppl. 3): 196, 1911 (misspelled as *Joanisia*); Felt, Bull. N. Y. State Mus., 165: 156, 1913; Kieffer, Gen. Insect., 152: 292, 1913; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 256, 1938.

Peromyia Kieffer, Bull. Soc. Ent. France, 1894: clxxv, 1894; Kieffer, Wien. Ent. Ztg., 13: 205, 1894; Kieffer, Misc. Ent., 3: 76, 1895; Kieffer, Bull. Soc. Hist. Nat. Metz, (ser. 2) 8: 48, 1898; Felt, Jour. N. Y. Ent. Soc., 19: 32, 1911; Enderlein, Arch. Naturg., 77 (Bd. 1, Suppl. 3): 196, 1911; Felt, Bull. N. Y. State Mus., 165: 160, 1913; Kieffer, Gen. Insect., 152: 292, 1913; Mani, Rec. Ind. Mus., 36 (1934): 383, 1935; Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 264, 1938.

Camptoza Enderlein, Tierw. Mitteleur, 6 (Lief 2, Teil 3) 62, 1936.

Genotype.—Monobasic, *Peromyia leveillei* Kieffer.

Genotypes of synonyms and homonyms.—*Joannisia:* by subsequent designation of Coquillett, 1910, *Joannisia aurantiaca* Kieffer; *Camptoza:* the first of two species originally included, by present designation, *Joannisia kiefferiana* Enderlein.

Edwards studied Kieffer's original series of the genotype of *Peromyia* and stated that the adults of this species differed from *Joannisia* Kieffer only in having two palpal segments instead of three or four. This character is here considered not to be of fundamental importance. Since the name *Joannisia* Kieffer is a homonym, the name *Peromyia* should be used.

The genus *Peromyia* contains a homogeneous group of small species. *Peromyia* differs considerably from the other genera of the Micromyini in having the costa not or but little produced beyond R_5, the sensory pore of R_5 at about the level of the tip of R_1 (which is evanescent distally), and the flagellum of both sexes with subglobular nodes and elongate stems. The flagellum is twelve-segmented in the male, with the terminal segment often binodose, in the female nine(rarely eight or ten)-segmented; each flagellar segment bears several elongate sensorial processes distally which are sometimes digitate. There are two spermathecae. The body and appendages are densely clothed with scales, but the scales are easily lost, so that it is often difficult to appreciate the presence of the scales or their form.

The male genitalia are of a distinctive type. The genital rod is entirely absent, but there is a sclerotized plate ventrally in the aedeagus. In a specimen of *photophila* dissected by the writer, the tegmen appears as a cup-shaped dorsal saddle of the membranous extension of the common genital duct; the sclerotized ventral portion appears as a separate sheath, incomplete proximo-dorsally, in which the genital duct ends. It is possible that this sclerotized ventral portion is the modified distal end of the genital duct.

There are a large number of species of *Peromyia*, although only five species are recognized at the present in North America. *P. photophila*, a common species in the eastern United States, was reared from decaying peony roots, in Pennsylvania. *P. bengalensis* Kieffer was considered to be an inquiline in galls on *Lindera pulcherrima*. Kieffer and Winnertz reared a number of European species from decaying wood; one species was reared from a fungus and another from tufts of moss.

Key to Species (Males)

1. Basiclasper with a pubescent dorsal lobe directed caudally; disticlasper very large ..... *ovalis* (Edwards)
   Basiclasper without a dorsal lobe; disticlasper short 2
2. Disticlasper compressed and attenuated, bare and acute distally. *photophila* (Felt)
   Disticlasper plump, rounded distally 3

3. Disticlasper bearing a dense group of bristles at distal end. *neomexicana* (Felt)
   Disticlasper without a dense group of bristles distally 4
4. Tegmen with distal third narrowed and slender..... *modesta* (Felt)
   Tegmen broadly rounded distally, not narrowed..... *borealis* (Felt)

Peromyia photophila (Felt), new combination

Campylomyza photophila Felt, Bull. N. Y. State Mus., 110: 99, 1907.

Joannisia photophila (Felt): Felt, Bull. N. Y. State Mus., 124: 313, 1908; Felt, Bull. N. Y. State Mus., 165: 158, 1913 (fig. palp, male antennal segments).

Campylomyza carolinae Felt, Bull. N. Y. State Mus., 110: 100, 1907. New synonymy.

Joannisia carolinae (Felt): Felt, Bull. N. Y. State Mus., 124: 313, 1908; Felt, Bull. N. Y. State Mus., 165: 158, 1913 (photogr. wing).

Joannisia flavoscuta Felt, Bull. N. Y. State Mus., 124: 313, 1908; Felt, Bull. N. Y. State Mus., 165: 159, 1913. New synonymy.

Joannisia flavopedalis Felt, Bull. N. Y. State Mus., 124: 313, 1908; Felt, Bull. N. Y. State Mus., 165: 157, 1913. New synonymy.

Joannisia pennsylvanica Felt, Jour. Econ. Ent., 4: 476, 1911 (misspelled as *Joanissia*); Felt, Bull. N. Y. State Mus., 165: 159, 1913. New synonymy.

Joannisia nodosa Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 263, 1938 (fig. wing, male genitalia, palp, male and female antennal segments). New synonymy.

Peromyia photophila is a very small, yellowish species. The wings are densely clothed with macrotrichia; the costa ends abruptly or extends slightly beyond the tip of R_5. The palpus is densely clothed with scales and is four-segmented with the fourth segment very small, but occasionally the third and fourth segments are more or less united. The femora are clothed with long, narrow scales and short, broad scales, and below with long bristles; the tarsi are densely clothed with short, broad scales.

The male hypopygium is distinctive; the ninth tergum is very narrow and divided medially; the basiclasper roots are very broadly united distally; the disticlasper is deep, compressed, attenuated distally to a bare and acute apex; the tegmen is long, rather broad, somewhat narrowing on proximal two-thirds, broadly rounded on

distal third; the ventral sclerite is subelliptical, broadly rounded on distal half. The interstices of the penultimate abdominal segments above are sclerotized, each bearing a median enlargement. The flagellum of the male has the stems about as long as the nodes on the proximal segments, somewhat longer on more distal segments. The male types of *photophila* Felt, *carolinae* Felt, *pennsylvanica* Felt, and *flavoscuta* Felt are all essentially identical. The mount of the male of *pennsylvanica* is very poor, and the genitalia of this specimen cannot be made out in detail. The terminal antennal segment of *photophila* bears a small distal nipple; this nipple is slightly shorter in the type of *pennsylvanica* than in the types of *photophila*. The basiclaspers are partially divided below by a deep emargination; beyond this emargination the basiclasper bears an edentation in Felt's types. This edentation is small or absent in Minnesota males.

The flagellar segments of the female each have four long and slender sensorial processes. The flagellar stems are somewhat longer than the nodes on the middle segments; the terminal segment is ovoid. The proportional length of the flagellar stems appears to be somewhat variable in the long series at hand. The spermathecae are round lightly pigmented except peripherally; these, too, seem somewhat variable in size (one female has one of the spermathecae larger than the other). The female monotype of *flavopedalis* agrees in all respects with the type females of *carolinae* and *pennsylvanica*, except for the palpal segments. This monotype has three palpal segments, but the third segment is much longer than the second, and on one palp is partially subdivided just beyond the middle of the segment. Such a condition is sometimes found in the males of *photophila*.

Lectotype.—Male, by present designation, at the New York State Museum.

Types of synonyms.—*Carolinae:* lectotype male, at the New York State Museum; *flavopedalis:* monotype female, at the New York State Museum; *pennsylvanica:* lectotype male, by present designation, at the New York State Museum; *nodosa:* type male, at the British Museum (Natural History).

Specimens examined.—MINNESOTA: two females, Afton, September 6, 1941, A. E. Pritchard; three males, ten females, Alexandria, June 23, 1941, A. E. Pritchard; two males, seven females, Anoka, June 15, September 3 and 11, 1941, A. E. Pritchard; seven males, three females, Appleton, August 9 and 10, 1941, A. E. Pritchard; two females, Brownsville, May 29, 1941, A. E. Pritchard; two females, Detroit Lakes, June 20, 1941, A. E. Pritchard; one female,

Floodwood, August 1, 1941, A. E. Pritchard; two males, three females, Fosston, July 30, 1941, A. E. Pritchard; two females, Frontenac, May 29, 1941, A. E. Pritchard; one male, Glyndon, July 28, 1941, A. E. Pritchard; two males, three females, Houston Co., May 30 and 31, 1941, A. E. Pritchard; five females, John Latch State Park, May 29, 1941, A. E. Pritchard; one male, three females, Kent, June 19, 1941, A. E. Pritchard; three males, three females, Little Falls, July 25, 1941, A. E. Pritchard; one female, McIntosh, July 30, 1941, A. E. Pritchard; one female, Moorhead, June 21, 1941, A. E. Pritchard; one male, Pine City, August 4, 1941, A. E. Pritchard; seven females, St. Paul, August 4, 1941, A. E. Pritchard; one male, two females, Shevlin, July 30, 1941, A. E. Pritchard; two females, Stillwater, September 6, 1941, A. E. Pritchard; two females, Swan Lake, August 6, 1941, A. E. Pritchard; five females, Tenstrike, July 31, 1941, A. E. Pritchard; one female, Two Harbors, August 3, 1941, H. Knutson; one female, Wadena, July 2, 1941, A. E. Pritchard. NEW YORK: one male, Albany, July 4, 1906 (recorded as *photophila* by Felt; labelled "type," but cannot be considered such, since it is slide no. C472, which was not originally included as a type); two males, Albany, August 8, 1906 (lectotype and paralectotype of *photophila*); one male, Nassau, July 22 (not 24), 1906 (monotype of *flavoscuta*); one female, Newport, July 25, 1906 (monotype of *flavopedalis*); one male, Poughkeepsie, August 7, 1906 (paralectotype of *photophila*). NORTH CAROLINA: one male, one female, Davidson's River, September 23, 1906 (lectotype and paralectotype of *carolinae*). PENNSYLVANIA: one male, one female [Reading], November 14, 1908, bred from infested peony roots (lectotype and paralectotype of *pennsylvanica*). WISCONSIN: one female, Hudson, September 1, 1941, A. E. Pritchard.

Peromyia borealis (Felt), new combination

Joannisia borealis Felt, Jour. N. Y. Ent. Soc., 27: 280, 1919.

Joannisia roralis Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 260, 1938 (fig. male genitalia). New synonymy.

The male genitalia of *borealis* are distinctive. The ninth tergum has each lateral angle triangularly produced; disticlasper short and broad, somewhat angulate inside, rounded distally; tegmen long, rounded distally; ventral plate short, broadly rounded distally. The flagellar segments have the stems decidedly longer than the nodes; the terminal segment is binodose. The palpi are three segmented, the third segment slender, as long as the second or somewhat shorter. The femora are clothed with long and narrow scales; the tarsi are

densely clothed with short and broad scales. The costa extends slightly beyond R_5.

The female has not been recognized.

Monotype.—Male, at the New York State Museum.

Types of synonyms.—*Roralis:* type male, at the British Museum (Natural History).

Specimens examined.—MINNESOTA: one male, Afton, September 6, 1941, A. E. Pritchard; one male, Alexandria, June 23, 1941, A. E. Pritchard; one male, Tenstrike, July 31, 1941, A. E. Pritchard; one male, Vineland, May 24, 1941, A. E. Pritchard. NEW YORK: one male, Keene Valley, August 30, 1917, H. Notman (monotype of *borealis*).

Peromyia modesta (Felt), new combination

Campylomyza modesta Felt, Bull. N. Y. State Mus., 110: 99, 1907; Felt, Bull. N. Y. State Mus., 124: 316, 1908; Felt, Bull. N. Y. State Mus., 165: 170, 1913.

Peromyia modesta is known only from a single male specimen from New York. *Modesta* is closely related to *borealis* from which it differs in having the ninth tergum narrower with the lateral angles less produced, the disticlaspers more evenly ovate, and the tegmen narrow on the distal third. The antennae of the monotype are shrivelled and broken, but the stems do not appear to be longer than the nodes. The abdomen and legs are densely clothed with scales, the tarsal scales being rather narrow. The costa ends abruptly at the tip of R_5.

Monotype.—Male, at the New York State Museum.

Specimens examined.—NEW YORK: one male, Lake Clear, June 7, 1906 (monotype of *modesta*).

Peromyia neomexicana (Felt), new combination

Joannisia neomexicana Felt, Bull. N. Y. State Mus., 165: 160, 1913.

Peromyia neomexicana is known only from a single male from New Mexico. The hypopygium of this specimen is distinctive: the ninth tergum is narrow, the lateral angles somewhat widened; disticlasper short and broadly oval, the ventral sclerite smaller, very pale, and rather truncate distally. The stems of the flagellar segments are slightly longer than the nodes, distinctly longer on the distal segments; the terminal segment is long and slender, binodose. The palp is four segmented. The scales of the legs are rather long and slender. The costa ends at the tip of R_5.

Monotype.—Male, at the New York State Museum.

Specimens examined.—New Mexico: one male, Pecos, August 25 [T. D. A. Cockerell] (monotype of *neomexicana*).

Peromyia ovalis (Edwards), new combination

Joannisia ovalis Edwards, Proc. Roy. Ent. Soc. Lond., 7 (ser. B): 258, 1938 (fig. male genitalia, antennal segments).

Peromyia ovalis was described from two male specimens from England. Specimens from Minnesota agree in all respects with Edwards' description and figures of this species.

The male of *ovalis* is readily recognized by the hypopygium: the basiclasper above bears an elongate, pubescent, distal lobe which is directed posteriorly. The disticlasper is very large, elongate, and with the inner side broadly angulate. The tegmen is shield-shaped, turned down distally; the ventral sclerite above is a little shorter than the tegmen, truncate and turned up distally, below more heavily outlined, smaller and shield-shaped. The flagellar stems are a little longer than the nodes; the ultimate segment bears an elongate distal portion. The palpi are three segmented, the segments successively decreasing in size. The scales on the tarsi are rather narrow. The costa extends well beyond R_5.

The female of *ovalis* agrees with the male in regard to palpi, wing venation and vestiture. The flagellar stems are about half the length of the nodes; each flagellar segment bears three (sometimes two or four) elongate but strong sensorial processes. The two spermathecae are rounded, strongly outlined.

Type.—Male, at the British Museum (Natural History).

Specimens examined.—Minnesota: one female, Avon, June 24, 1941, A. E. Pritchard; one female, Alexandria, June 23, 1941, A. E. Pritchard; one male, Bemidji, June 31, 1941, A. E. Pritchard; one male, Brauerville, August 6, 1941, A. E. Pritchard; one male, Floodwood, August 1, 1941, A. E. Pritchard; two males, two females, St. Paul, July 19, 1941, A. E. Pritchard.

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